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38-112

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Chester Kolton, et al.
Application	:	10/721,520
For	:	ELECTRONIC ARTICLE SURVEILLANCE MARKER ASSEMBLY
Filed	:	November 24, 2003
Examiner	:	Unassigned
Art Unit	:	2859

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

LETTER FILING PETITION TO MAKE SPECIAL

Enclosed herewith is a Petition to Make Special and a Credit Card Payment Form authorizing payment of the required fee for filing the Petition. Please charge any other fees for filing same to our Deposit Account 18-1644.

Dated: June 21, 2004

Respectfully submitted,

John J. Torrente

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Attorney of Record

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 with Express Mail label no. EL293875061US addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: June 21, 2004

John J. Torrente
Signature

June 21, 2004
Date of Signature

PATENT
38-112

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Chester Kolton et al.

Serial No.: 10/721,520

Filed: November 24, 2003

For: ELECTRONIC ARTICLE SURVEILLANCE MARKER ASSEMBLY

Examiner : Unassigned

Art Unit: 2859

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

PETITION TO MAKE SPECIAL

Petition is hereby made to make the subject application special pursuant to 37 CFR 1.102 and MPEP 708.02 pursuant to the special examining procedure for certain new applications. The following averments are made on behalf of the Petition:

(A) The subject application has not received any examination by Examiner.

(B) All of applicants' claims in the subject application are directed to a single invention. However, if the Office determines that applicants' claims are directed to more than one invention, applicants will make an election without traverse of a group of claims directed to a single invention prior to the grant of special status.

(C) The fee for this Petition in the amount of $130, as called for in 37 CFR 1.17(h), is filed herewith.

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 with Express Mail label no. EL293875061US addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: June 21, 2004

John J. Torrente — June 21, 2004
Signature — Date of Signature

06/24/2004 EAREGAY1 00000084 10721520
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Applicants' Claims

Applicants' independent claim 1 is directed to an electronic article surveillance assembly comprising an upstanding housing having a closed ceiling and a floor having a continuous peripheral portion bounding a central floor opening, said housing having an interior cavity communicating with said central floor opening, an EAS marker being disposed in said housing interior cavity, said housing defining a sidewall extending from said ceiling to said continuous peripheral floor portion and tapered to form said housing with a periphery having a V-shaped cross-section. Applicants' independent claim 8 is directed to a combination of the electronic article surveillance assembly having a construction recited in claim 1 and an article of manufacture.

Search

Applicants' attorneys have conducted a pre-examination search of U.S. Patents, U.S. Published Applications, International Published Applications and foreign patents and published applications. The pre-examination search was not limited to any particular class/subclass combination. However, all of the relevant pre-examination search results are in the U.S. class 340, subclass 572.1 or International Classes G08B 13/00 and G09F 3/00.

Prior Art References

The references deemed most closely related to the subject application are U.S. Patent No. 4,746,908 to Montean, U.S. Patent No. 5,884,425 to Baldwin, U.S. Patent No. 6,199,309 to Markarian, U.S. Patent No. 6,404,341 to Reid, U.S. Patent No. 6,720,877 to Lian, et al., U.S.

Patent Application Publication No. 2001/0050616 to Lowe, Japanese Patent No. JP11339142 to Takanori, et al. and Japanese Patent No. JP2000011271 to Takanori, et al. Copies of these references are being submitted with this Petition.

Discussion of the References

The prior art references deemed most closely related to the subject matter encompassed by applicants' claims disclose theft prevention tags and/or labels incorporating a theft prevention tag. Applicants reviewed these references and none of the references teach or suggest an upstanding housing having a floor having a continuous peripheral portion bounding a central floor opening and an interior cavity communicating with the central floor opening, the housing defining a sidewall extending from the ceiling to the continuous peripheral floor portion and tapered to form the housing with a periphery having a V-shaped cross-section.

Particularly, the Montean patent, the Baldwin patent, the Reid patent, the Lowe published patent application and the Takanori, et al. patent (JP11339142) disclose an anti-theft tag assembly comprising a marker housed between a substantially flat support layer and a top layer. For example, FIGS. 2 and 2A of the Montean patent show a cross-sectional view of the tag assembly comprising a marker 10 disposed on a flat carrier support layer 16 and a top layer 20 covering the marker and adhering to the support layer 16 around the periphery of the marker 10. FIG. 3 of the Reid patent, FIG. 5 of the Baldwin patent, FIGS. 1 and 2 of the Lowe patent application publication and FIG. 14 of the Takanori, et al. patent show similar constructions. Although the ends of the top layer covering the markers disclosed in these references are angled, none of these references teach or suggest an upstanding housing defining a sidewall extending from the ceiling to a continuous peripheral floor portion and tapered to form the housing with a

periphery having a V-shaped cross-section. Moreover, none of these references teach or suggest an upstanding housing having a floor with a continuous peripheral portion bounding a central floor opening and an interior cavity communicating with the central floor opening. Applicants' claims 1 and 8, and their respective dependent claims, all of which recite such features, therefore patentably distinguish over the Montean, Baldwin, Reid and Takanori, et al. patents and the Lowe patent application publication.

The Markarian patent also discloses an anti-theft tag 20 comprising a top layer 24 and a bottom layer 22. In the Markarian patent, the bottom layer 22 forms a cavity well 30 which appears as a raised portion and is of a depth to receive therein a security device 32. FIG. 7; Col. 5, lines 27-37. As shown in FIG. 7 of the Markarian patent, which is a side view of the tag 20, the cavity well 30 has angled sides. However, the cavity well 30 in the Markarian patent does not teach or suggest a housing defining a sidewall extending from the ceiling to the continuous floor portion and with a periphery having a V-shaped cross-section. Moreover, there is nothing taught or suggested in the Markarian patent of a central floor opening in the housing and an interior cavity communicating with the central floor opening. Accordingly, applicants' independent claims 1 and 8, and their respective dependent claims, also patentably distinguish over the Markarian patent.

The Takanori, et al. patent (JP2000-011271) discloses a theft-prevention tag comprising a protection case 11, including a top cover 11a and a base 11b, and a resonance circuit 14 housed by the protection case 11. As can be seen in FIG. 1 of the Takanori, et al. patent, the top cover 11a of the case 11 has angled walls. However, the Takanori, et al. patent does not teach or suggest an upstanding housing having a floor having a continuous peripheral portion bounding a central floor opening and an interior cavity communicating with the central floor opening, the

housing defining a sidewall extending from the ceiling to the continuous peripheral floor portion and tapered to form the housing with a periphery having a V-shaped cross-section. Applicants' independent claims 1 and 8, and their respective dependent claims, thus also patentably distinguish over the Takanori, et al. patent

Furthermore, the Lian, et al. patent does not disclose the construction recited in applicants' independent claims 1 and 8, and their respective dependent claims. FIG. 16 of the Lian, et al. patent shows a marker assembly comprising a resonator 64 residing in a resonator cavity 60 formed by a plastic housing material 62, which is covered by a substantially flat cover sheet 66 and a second cover sheet 70. FIG. 16. The cover sheets 66 and 70 are sealed to one another by a pressure sensitive adhesive. Col. 6, lines 48-63. As can be seen in FIG. 16, the cover sheet 66 is significantly wider than the cavity 60 so as to provide a pair of wings 72 which can adhere to curved surfaces. FIG. 16; Col. 6, lines 60-63.

FIG. 17 of the Lian, et al. patent shows an alternative embodiment of an EAS marker which includes a molded housing 80 with flexible sections 82 adapted to wrap around a curved surface. FIG. 17; Col. 6, lines 64-67. The flexible sections 82 are formed by cuts in the housing material. FIG. 17; Col. 7, lines 1-2.

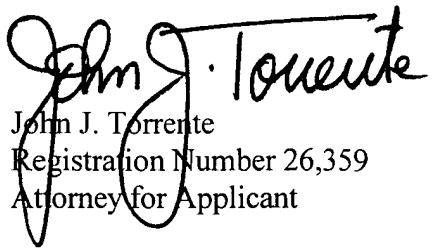
The constructions recited in applicants' claims 1 and 8, and their respective dependent claims, however, are not taught or suggested by the Lian, et al. patent. Particularly, neither FIG. 16 nor FIG. 17 of the Lian, et al. patent disclose an upstanding housing having a floor with a central opening and an interior cavity communicating with the central floor opening, wherein the housing defines a sidewall extending from the ceiling to the continuous peripheral floor portion and tapered to form the housing with a periphery having a V-shaped cross-section.

In view of the above, it is submitted that applicants' claims patentably distinguish over

the prior art references deemed most closely related to the subject matter encompassed by such claims. Accordingly, applicants' respectfully request that this Petition be granted and that applicants' claims be allowed.

Dated: June 21, 2004

Respectfully submitted,



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PATENT ABSTRACTS OF JAPAN

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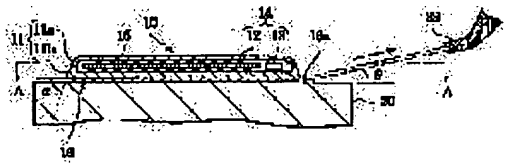
C09J 7/02

(21) Application number : 10-180034
(22) Date of filing : 26.06.1998

(71) Applicant : MITSUBISHI MATERIALS CORP
(72) Inventor : ENDO TAKANORI
YONEZAWA MASA
MIYAKE MASAMI
HACHIMAN SEIRO

(54) THEFT PREVENTION TAG, ATTACHMENT AND DETACHMENT METHOD FOR THE SAME AND REMOVAL TOOL FOR THE SAME

(57) Abstract:
PROBLEM TO BE SOLVED: To make it possible for a dealer of an article such as a shop clerk to remove easily a tag from the article by making a person who tries to shoplift the article difficult to remove this theft prevention tag from the article.
SOLUTION: This is an attaching and detaching method for a theft prevention tag 10 which is equipped with a resonance circuit part 14 that is contained in a protection case 11, installed on an article 20 for theft monitoring and resonates with a radio wave of a specified frequency transmitted from a transmission antenna 21. A double coated adhesive tape 16 is adhered on a lower surface of the protection case 11 and, thus, the tag is adhered on the article. If the tag is expanded by an angle θ of smaller than 35 degrees towards an adhesive surface when the tag is to be removed, the adhesive tape 16 is removed from both the article 20 and the protection case 11. The length of an drawing part 16a of the adhesive tape is made less than 10 mm when the adhesive tape 16 adheres the protection case 11 to the article 20 so that the adhesive tape is not expanded by fingers of a shoplifter and the drawing part 16a is expanded by a removal tool 29.



LEGAL STATUS

[Date of request for examination]	31.03.2000
[Date of sending the examiner's decision of rejection]	
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
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[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

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(51)Int.Cl.'	識別記号	ＦＩ	テーマコード'（参考）
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Ｃ０９Ｊ　7/02		Ｃ０９Ｊ　7/02	５Ｃ０８４

審査請求　未請求　請求項の数10　ＯＬ　（全９頁）

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(22)出願日　平成10年６月26日(1998.6.26)

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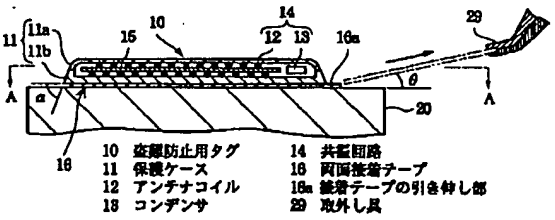
最終頁に続く

(54)【発明の名称】　盗難防止用タグ及びその着脱方法並びにその取外し具

(57)【要約】
【課題】　物品を万引する者に対しては盗難防止用タグを物品から取外しにくく店員などの物品の取扱者にはこのタグを容易に物品から取外すことができる。
【解決手段】　保護ケース１１に収容されて盗難監視用の物品２０に取付けられ送信アンテナ２１から送信された特定周波数の電波に共振する共振回路部１４を備えた盗難防止用タグ１０の着脱方法である。両面接着テープ１６が保護ケース１１の下面に接着されてこれによりタグが物品に接着する。タグを取外すときには接着面に対して約３５度以下の角度θで引張ると、接着テープ１６が物品２０及び保護ケース１１の双方から剥がれる。万引者の手指で接着テープを引張られないように接着テープ１６が保護ケース１１を物品２０に取付けたときの接着テープの引き伸し部１６ａの長さを１０mm以下にし、取外し具２９により引き伸し部１６ａを引張る。



【特許請求の範囲】

【請求項１】　保護ケース(11)に収容されて盗難監視用の物品(20)に取付けられ送信アンテナ(21)から送信された特定周波数の電波に共振する共振回路部(14)を備えた盗難防止用タグにおいて、

両面接着テープ(16)が前記保護ケース(11)の下面に接着されかつ接着面に対して約３５度以下の角度(θ)で引張ることにより前記物品(20)及び前記保護ケース(11)の双方から剥がれる引き伸し剥離接着テープであって、

前記両面接着テープ(16)が前記保護ケース(11)を物品(20)に取付けたときに長さ１０ｍｍ以下の接着テープの引き伸し部(16a,16b)を有することを特徴とする盗難防止用タグ。

【請求項２】　保護ケース(11)の側面とその上面が作る角部の丸み半径が前記保護ケース(11)の厚さの１／５以上である請求項１記載の盗難防止用タグ。

【請求項３】　保護ケース(11)の側面とその下面が作る角度(α)が８０度以下である請求項１又は２記載の盗難防止用タグ。

【請求項４】　引き伸し剥離接着テープ(16)が引き伸し方向に対して垂直方向に複数本短冊状に保護ケース(11)の下面に配列された請求項１又は２記載の盗難防止用タグ。

【請求項５】　送信アンテナ(21)から送信された特定周波数の電波に共振する共振回路部(14)が保護ケース(11)に収容された盗難防止用タグ(10)の前記保護ケースの下面に両面接着テープ(16)の一方の主面を接着し、盗難監視用の物品(20)に前記両面接着テープ(16)の他方の主面を接着した後、前記物品(20)から前記保護ケース(11)を取外す盗難防止用タグの着脱方法において、

前記両面接着テープ(16)が接着面に対して約３５度以下の角度(θ)で引張ることにより物品(20)及び保護ケース(11)の双方から剥がれる引き伸し剥離接着テープであって、

前記両面接着テープ(16)の主要部分の一方の主面を前記保護ケース(11)の下面に接着し、

前記保護ケース(11)を前記両面接着テープ(16)により物品(20)に取付けたときに前記保護ケース(11)の下面からはみ出した前記両面接着テープ(16)の残部にはみ出し長さ５ｍｍ以下のテープの折返しループ部(16b)を設け、

前記ループ部(16b)に針状に形成された取外し具(30)の先端部(30b)を挿入して前記両面接着テープ(16)を接着面に対して約３５度以下の角度(θ)で引張ることにより前記保護ケース(11)を前記物品(20)から取外すことを特徴とする盗難防止用タグの着脱方法。

【請求項６】　送信アンテナ(21)から送信された特定周波数の電波に共振する共振回路部(14)が保護ケース(11)に収容された盗難防止用タグの前記保護ケースの下面に両面接着テープ(16)の一方の主面を接着し、盗難監視用の物品(11)に前記両面接着テープ(16)の他方の主面を接着した後、前記物品(20)から前記保護ケース(11)を取外す盗難防止用タグの着脱方法において、

前記両面接着テープ(16)が接着面に対して約３５度以下の角度(θ)で引張ることにより物品(20)及び保護ケース(11)の双方から剥がれる引き伸し剥離接着テープであって、

前記両面接着テープ(16)の主要部分の一方の主面を前記保護ケース(11)の下面に接着し、

前記保護ケース(11)を前記両面接着テープ(16)により物品(20)に取付けたときに前記保護ケース(11)の下面からはみ出した前記両面接着テープ(16)の残部に引き伸し具(17,18,19)を前記保護ケース(11)に隣接して取付け、

前記引き伸し具(17,18,19)を前記両面接着テープ(16)とともに接着面に対して約３５度以下の角度(θ)で引張ることにより前記保護ケース(11)を前記物品(20)から取外すことを特徴とする盗難防止用タグの着脱方法。

【請求項７】　両面接着テープ(16)の残部の一方の主面を保護ケース(11)の側面に接着し、前記残部の他方の主面に引き伸し具(17)を接着する請求項６記載の盗難防止用タグの着脱方法。

【請求項８】　両面接着テープ(16)の残部の一方の主面の一部を保護ケース(11)の側面に非接着になるように構成した請求項７記載の盗難防止用タグの着脱方法。

【請求項９】　両面接着テープ(16)の残部の一方の主面が接着される保護ケース(11)の側面又は引き伸し具(17,18,19)のいずれか一方又は双方に１又は２以上の溝(11d,18a,19c)を設け、

前記溝(11d,18a,19c)に係合可能な係合部(31d,32b)を有する取外し具(31,32)の前記係合部(31d,32b)を前記溝(11d,18a,19c)に係合して前記引き伸し具(17,18,19)を前記両面接着テープ(16)とともに保護ケース(11)の側面から剥離させる請求項７又は８記載の盗難防止用タグの着脱方法。

【請求項１０】　保護ケース(11)の側面又は引き伸し具(17,18,19)のいずれか一方又は双方に設けられた１又は２以上の溝(11d,18a,19c)に係合可能な係合部(31d,32b)を有し、前記係合部(31d,32b)を前記溝(11d,18a,19c)に係合した状態で引き伸し具(17,18,19)を両面接着テープ(16)とともに保護ケース(11)から分離して引張るように構成された盗難防止用タグの取外し具。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、商品等の物品が無断で持ち出されたときにその盗難を報知するためのタグに関し、物品を万引する者に対しては物品から取外しにくく店員などの物品の取扱者には物品から取外し易い盗難防止用タグに関する。更に詳しくはこのタグの着脱方法及びその取外し具に関するものである。

【０００２】

【従来の技術】従来、この種の盗難防止用タグとして、

盗難監視用の物品に取付けられたタグの共振回路部が電波発信装置からの特定周波数の電波に共振し、タグが盗難監視用の物品から分離されたか否かを分離検知手段が検出し、この分離検知手段の検出出力に基づいて分離報知部が報知音出力手段を制御するように構成された盗難防止用タグが開示されている（特開平８－１８５５８４）。この盗難防止用タグでは、共振回路部が絶縁性誘電体の薄膜の両面にエッチング等により所定形状の導電性金属箔を形成して構成される。例えば、薄膜表面に、導電性金属箔により渦巻状に形成されたコイル部と、このコイル部の渦巻状の中心部にコイル部に連続するコンデンサの表面側平面パターンとが形成される。上記盗難監視用の物品を販売する店の出入り口には、送信アンテナと受信アンテナとが互いに所定の間隔をあけて立設され、これらのアンテナは制御部に電気的に接続される。制御部は共振回路部で共振する周波数の電波を送信アンテナから送信させるとともに、受信アンテナからの受信信号の信号レベルを常にチェックするように構成される。更に制御部の制御出力には警報を発するスピーカが接続される。

【０００３】このように構成された盗難防止用タグでは、盗難を監視している物品が未清算のまま送信アンテナ及び受信アンテナ間を通過しようとすると、送信アンテナから送信された電波が盗難防止用の物品に取付けられたタグの共振回路部で共振するため、受信アンテナには受信レベルの変調された受信信号が受信される。この結果、制御部はスピーカから警報を発し、未清算商品の持ち出しを防止できる。このタグの存在を知っている万引きを試みる者はこのタグを取外してから販売店を出ようとする。このため、プラスチックなどの保護ケースに収容された盗難防止用タグは、保護ケースの下面に強力な接着剤を設けて商品の包装箱又は商品自体に貼着している。

【０００４】

【発明が解決しようとする課題】しかし、保護ケース入りの盗難防止用タグを強力に商品の包装箱又は商品自体に貼着すると、商品が正規に購入された場合に店員がタグを剥がすと、包装箱や商品自体が損傷したり、或いは接着剤が残存して、これらの見栄えを損う。また剥がしたタグは再使用をすることが困難になる。

【０００５】本発明の目的は、物品を万引する者に対しては物品から取外しにくく店員などの物品の取扱者には物品から取外し易い盗難防止用タグを提供することにある。本発明の別の目的は、物品を万引する者に対しては盗難防止用タグを物品から取外しにくく店員などの物品の取扱者にはこのタグを容易に物品から取外すことができる着脱方法を提供することにある。本発明の更に別の目的は、物品に接着した盗難防止用タグを容易に取外すことができる取外し具を提供することにある。

【０００６】

【課題を解決するための手段】請求項１に係る発明は、図１及び図１８に示すように、保護ケース１１に収容されて盗難監視用の物品２０に取付けられ送信アンテナ２１から送信された特定周波数の電波に共振する共振回路部１４を備えた盗難防止用タグ１０において、両面接着テープ１６が保護ケース１１の下面に接着されかつ接着面に対して約３５度以下の角度θで引張ることにより物品２０及び保護ケース１１の双方から剥がれる引き伸し剥離接着テープであって、両面接着テープ１６が保護ケース１１を物品２０に取付けたときに長さ１０ｍｍ以下の接着テープの引き伸し部１６ａを有することを特徴とする盗難防止用タグである。引き伸し部１６ａを掴み得る取外し具２９により接着テープの引き伸し部１６ａをしっかり掴み、図１及び図３に示すように接着テープ１６を引張ると、接着テープの幅が狭まり、接着テープ１６は物品２０及び保護ケース１１の双方から剥がれる。

【０００７】請求項５に係る発明は、図５及び図６に示すように、送信アンテナ２１から送信された特定周波数の電波に共振する共振回路部１４が保護ケース１１に収容された盗難防止用タグ１０の保護ケース１１の下面に両面接着テープ１６の一方の主面を接着し、盗難監視用の物品２０に両面接着テープ１６の他方の主面を接着した後、物品２０から保護ケース１１を取外す盗難防止用タグの着脱方法において、両面接着テープ１６が接着面に対して約３５度以下の角度θで引張ることにより物品２０及び保護ケース１１の双方から剥がれる引き伸し剥離接着テープであって、両面接着テープ１６の主要部分の一方の主面を保護ケース１１の下面に接着し、保護ケース１１を両面接着テープ１６により物品２０に取付けたときに保護ケース１１の下面からはみ出した両面接着テープ１６の残部にはみ出し長さ５ｍｍ以下のテープの折返しループ部１６ｂを設け、このループ部１６ｂに針状に形成された取外し具３０の先端部３０ｂを挿入してその取付け部３０ａと先端部３０ｂを掴み、両面接着テープ１６を接着面に対して約３５度以下の角度θで引張ることにより保護ケース１１を物品２０から取外すことを特徴とする盗難防止用タグの着脱方法である。この方法によれば、先端が針状に形成された取外し具３０を用いないと、接着テープ１６は引っ張れず、より確実に盗難防止用タグ１０の物品２０からの無断剥離を防止できる。

【０００８】請求項１０に係る発明は、図１２～図１６に示すように、保護ケース１１の側面又は引き伸し具１７，１８，１９のいずれか一方又は双方に設けられた１又は2以上の溝１１ｄ，１８ａ，１９ｃに係合可能な係合部３１ｄ，３２ｂを有し、係合部３１ｄ，３２ｂを溝１１ｄ，１８ａ，１９ｃに係合した状態で引き伸し具１７，１８，１９を両面接着テープ１６とともに保護ケース１１から分離して引張るように構成された盗難防止用タグの取外し具３１，３２である。この取外し具３１，

３２を用いることにより、店員のような物品の取扱者が容易に接着テープ１６を引張ることができ、盗難防止用タグ１０を物品２０から剥離することができる。

【０００９】

【発明の実施の形態】次に本発明の第１の実施の形態について説明する。図１及び図２に示すように、盗難防止用タグ１０はプラスチックの保護ケース１１を有し、この保護ケース１１にはアンテナコイル１２とこのアンテナコイルの両端に接続されたコンデンサ１３からなる共振回路１４が収容される。保護ケース１１は上蓋１１ａとベース１１ｂからなる。この保護ケース１１の下面には両面接着テープ１６が設けられる。タグ１０の保護ケース１１は盗難監視用の物品２０にこの接着テープ１６により取付けられる。後述するように接着テープ１６は感圧接着剤を塗布されているため、接着するときには約３０秒ほど手指の力で保護ケース１１を物品２０に押付けておく。アンテナコイル１２は導線を板状の磁性材からなる磁芯１５に巻かれて形成される。物品２０は例えば手軽に持運びができる高価な商品である。この実施の形態では、図１及び図４に示すように盗難防止用タグ１０はその保護ケース１１の側面とその上面が作る角部の丸み半径（corner radii）が前記保護ケース(11)の厚さの１／５以上、好ましくは２／３以上になるように形成される。この丸み半径を作ることと併せて又はこれとは別に保護ケース１１の側面とその下面が作る角度αを８０度以下に形成することが好ましい。この角度αは６０度以下であればより好ましい。これにより万引きを試みる者は保護ケース１１を掴みにくくなり、タグの無断剥離がより一層防止できる。

【００１０】両面接着テープ１６は好ましくは幅１０～２０ｍｍであって、短冊状に作られることが更に好ましい。短冊状にすることにより、接着テープ１６がより伸び易くなり好ましい。接着テープの長さ及び短冊状にしたときの本数はそれぞれ保護ケースの下面の面積に応じて決められる。短冊状で１本の接着テープでは保護ケースの下面を覆いきれない場合、接着テープ１６は引き伸し方向に対して垂直方向に複数本並べることが好ましい。図１では３本の短冊状の接着テープ１６が配列している。また接着テープ１６は保護ケース１１を物品２０に取付けたときに長さ１０ｍｍ以下の接着テープの引き伸し部１６ａを有する。この引き伸し部１６ａには接着剤層を設けないでおく。引き伸し部１６ａの長さが１０ｍｍを越えると、万引きを試みる者が手指で接着テープ１６を引張ることができ好ましくない。好ましくは３～５ｍｍである。

【００１１】図１８に示すように、共振回路１４は、例えば店舗の出入口に立設された送信アンテナ２１から送信された特定周波数の電波に共振するようになっている。この出入口には送信アンテナ２１と所定の間隔をあけて受信アンテナ２３が立設される。受信アンテナ２３は制御部２４の制御入力に接続され、制御部２４の制御出力に送信アンテナ２１が接続される。また制御部２４の制御出力には警報を発するスピーカ２６が接続される。制御部２４は共振回路部１４で共振する周波数の電波を送信アンテナ１３から送信させるとともに、受信アンテナ２３からの受信信号の信号レベルを常にチェックするように構成される。即ち、送信アンテナ１３から送信された電波を直接受信アンテナ２３が受信した場合の信号レベルを基準値とし、送信アンテナ１３から送信された電波がタグ１２の共振回路部１４で共振して受信アンテナ２３が受信すると、この信号レベルは上記基準値より所定値だけ大きくなるが、このとき制御部２４はスピーカ２６を鳴動させるように構成される。

【００１２】両面接着テープ１６は接着面に対して約３５度以下、好ましくは約１０度以下の角度θで引張ることにより物品２０及び保護ケース１１の双方から剥がれる特性を有する、特表平８－５０７９４１号公報及び特表平９－５０２２１３号公報に示される引き伸し剥離接着テープである。約３５度を越えると接着テープ１６全体に引張り力が及ばなくなり、接着テープ１６が物品２０及び保護ケース１１の双方から剥がれなくなる。この接着テープ１６は約０．７５ｍｍ～約２５ｍｍの厚さの支持体とこの支持体の両面に塗布された感圧接着剤層とにより構成される。この支持体は、ポリマー泡の層及び／又は中実のポリマーフィルムの層を含み、少なくとも２５００ｐｓｉのヤング率と、破断時に約５０％～約１２００％の長さ方向の伸びと、好ましくは約１０ １ｂ．／ｆｔ^3～約１５ １ｂ．／ｆｔ^{3}の密度を有する。ポリマー泡の層及び／又は中実のポリマーフィルムの層には、高密度ポリエチレン、低密度ポリエチレン、線状低密度ポリエチレン及び線状超低密度ポリエチレンを含むポリエチレン、ポリプロピレン及びポリブタジエンのようなポリオレフィン；ポリ塩化ビニル及びポリ酢酸ビニルのようなビニル共重合体；エチレン／メタクリレート共重合体、エチレン／酢酸ビニル共重合体、アクリロニトリル－ブタジエン－スチレン共重合体、及びエチレン／プロピレン共重合体のようなオレフィン系共重合体；アクリルポリマー及びアクリル共重合体；ポリウレタン；及びこれらの組合せが含まれる。また上記ポリマーは、ポリプロピレン／ポリエチレン、ポリウレタン／ポリオレフィン、ポリウレタン／ポリカーボネート、ポリウレタン／ポリエステルのようなプラスチック性でかつエラストマ性の材料の混合物、又は配合物でもよい。

【００１３】感圧接着剤層は、剥離速度１２．７ｃｍ／分でＰＳＴＣ－１、ＰＳＴＣ－３及びＡＳＴＭ Ｄ９０３－８３により測定されて、１８０度の剥離角で、約４Ｎ／ｄｍ～約２００Ｎ／ｄｍ、好ましくは約２５Ｎ／ｄｍ～約１００Ｎ／ｄｍの範囲にある接着特性を有する。この感圧接着剤層は約１５μｍ～約１ｍｍの厚さを有し、感圧接着剤層には、天然ゴムのような粘着性ゴム接

着剤；オレフィン；シリコーン；ポリイソプレン；ポリブタジエン；及びスチレン－イソプレン－スチレンのような合成ゴム接着剤、スチレン－エチレン－ブチレン－スチレンとスチレン－ブタジエン－スチレンのブロック共重合体、及び他の合成エラストマ；及び放射線重合、溶液重合、懸濁重合、又はエマルジョン重合により得られるイソオクチルアクリレートとアクリル酸の共重合体のような粘着性又は非粘着性のアクリル接着剤が含まれる。

【００１４】図１及び図３に示すように、接着テープ１６により保護ケース１１を取付けた後、この保護ケース１１を剥がすときには、保護ケース１１が剥がれたときに接着テープとともに飛んでいかないように、手指などで保護ケース１１を物品２０に押し付けた状態で両面接着テープ１６の引き伸し部１６ａを引き伸し具２９により挟んで接着面に対して約３５度以下、好ましくは約１０度以下の角度θで引張る。これにより接着テープ１６はその支持体の幅を狭めながら伸張し、このとき支持体にガラス状材料の破壊と同様に鋭角タイプの亀裂成長を生じる。この亀裂成長は接着剤の脆性離層破壊を引き起こし、この破壊は僅かな力で接着テープ１６と保護ケース１１及び物品２０のそれぞれの界面で起こり、接着テープ１６はその支持体が破断することなく、物品２０及び保護ケース１１の双方に感圧接着剤の残留物を残すことなく、また物品２０及び保護ケース１１の双方を損傷することなく、きれいに剥がれる。接着テープ１６は剥がれた後は、支持体のエラストマ性によって元の形状又は寸法に戻らない。

【００１５】次に図５及び図６に基づいて本発明の第２の実施の形態について説明する。両面接着テープ１６の構成については、第１の実施の形態と同様である。この実施の形態では、図５に示すように保護ケース１１の周縁の一部が張り出すように形成され、この張り出し部１１ｃのすぐ下に接着テープ１６の折返しループ１６ｂが配置されるように接着テープ１６が保護ケース１１の下面に設けられる。即ち、折返しループ１６ｂは保護ケースの下面から５ｍｍ以下の長さではみ出る。好ましくは３～５ｍｍである。この実施の形態では、図６に示される取外し具３０が用いられる。取外し具３０は針状に形成された先端部３０ｂとその取付け部３０ａとを有する。接着テープ１６により保護ケース１１を取付けた後、この保護ケース１１を剥がすときには、ループ部１６ｂに取外し具３０の先端部３０ｂを挿入し、取付け部３０ａ及び先端部３０ｂを掴んで接着テープ１６を接着面に対して約３５度以下の角度θで引張ることにより、保護ケース１１を物品２０から取外すことができる。

【００１６】次に図７～図１２に基づいて本発明の第３の実施の形態について説明する。両面接着テープ１６の構成については、第１の実施の形態と同様である。この実施の形態では、図７に示すように保護ケース１１の上縁には一対の溝１１ｄ，１１ｄが設けられる。この保護ケース１１の下面に短冊状の３本の両面接着テープ１６の主要部分の一方の主面を接着する。この接着テープ１６の残部の両面にも接着剤層が設けられる。真ん中の接着テープ１６の残部の一方には紙片１６ｃを貼り、後述する引き伸し具１７の保護ケース側面への接着力を弱めるようにしておく。次いで図８に示すように保護ケース１１を両面接着テープ１６により物品（図示せず）に取付けたときに保護ケース１１の下面からはみ出した両面接着テープ１６の残部の一方の主面を保護ケース１１の側面に接着する。次に図９に示すようにこの残部の他方の主面に引き伸し具１７を接着する。上記一対の溝１１ｄ，１１ｄはいずれか１つでもよく、また引き伸し具１７に設けてもよい。非接着側の引き伸し具１７の下辺は引き伸し具を剥がしたときに倒れ易いように傾斜面１７ａになっている。

【００１７】図１０はこの引き伸し具１７を引張る取外し具３１を示す。取外し具３１はつかみバサミのような形状をなし、２本のアーム３１ａ，３１ｂが支点３１ｃで枢支される。アーム３１ａの先端は二股に分かれ、アーム３１ｂの先端はシャベル３１ｅのような形状になっている。二股の先端は係合部３１ｄ，３１ｄとなり、これらの間隔は上記溝１１ｄ，１１ｄの間隔に等しく、かつ係合部３１ｄ，３１ｄは溝１１ｄ，１１ｄに挿入可能な幅を有する。取外し具３１は通常のハサミと同様にアーム３１ａ及び３１ｂを互いに近付けるように握ることにより、先端部３１ｄ，３１ｄとシャベル３１ｅが引き伸し具１７を把持できるようになっている（図１２）。なお、溝１１ｄ，１１ｄの横断面の形状を図示するような正方形でなく、台形、三角形、半円形などの形状にしておき、取外し具３１の係合部３１ｄ，３１ｄの横断面の形状及び寸法をこの溝１１ｄの横断面の形状と寸法とそれぞれ同一にしておけば、この取外し具３１を用いない限り、保護ケース１１を絶対に剥し得ないようにすることができる。図１１に示すように、接着テープ１６の残部の他方の主面に引き伸し具１７を接着した後、取外し具３１の先端部３１ｄ，３１ｄを溝１１ｄ，１１ｄに挿入し、アーム３１ａを矢印の方向に倒して、引き伸し具１７を破線に示すように保護ケース１１の側面より剥がす。図７に示した紙片１６ｃを接着テープと保護ケース側面との間に介在させたため、引き伸し具１７は取外し具３１のテコの作用も加わって容易に剥がれる。次いで図１２に示すように取外し具３１の先端部３１ｄ，３１ｄとシャベル３１ｅで引き伸し具１７を掴んで、図の破線に示すように引張り、接着テープ１６が伸張すれば、前記実施の形態と同様に保護ケース１１が物品２０から剥がれる。

【００１８】次に図１３～図１５に基づいて本発明の第４の実施の形態について説明する。両面接着テープ１６の構成については、第１の実施の形態と同様である。ま

た引き伸し具１８の保護ケース１１への取付け方法は第３の実施の形態と同様である。この実施の形態では、図１３及び図１４に示すように引き伸し具１８の両側には垂直の溝１８ａ，１８ａが形成される。この実施の形態では、図１５に示される取外し具３２が用いられる。取外し具３２は取手３２ａとこの取手に固定された係合部３２ｂ，３２ｂを有する。係合部３２ｂ，３２ｂは一対のL字状フックに形成される。接着テープ１６により保護ケース１１を取付けた後、この保護ケース１１を剥がすときには、係合部３２ｂ，３２ｂを上方から溝１８ａ，１８ａに係合させ、図１３の矢印の方向に引張る。接着テープ１６が伸張すれば、前記実施の形態と同様に保護ケース１１が物品２０から剥がれる。なおこのとき、保護ケース１１の側面に接着される側の接着テープ面に、第３の実施の形態と同様に紙片などを挟み、非接着部を作っておけば、引き伸し具１８を保護ケース１１から容易に剥がせる。

【００１９】更に図１６及び図１７に基づいて本発明の第５の実施の形態について説明する。両面接着テープ１６の構成については、第１の実施の形態と同様である。また引き伸し具１８の保護ケース１１への取付け方法は第３の実施の形態と同様である。この実施の形態では、図１６及び図１７に示すように引き伸し具１９は中央片１９ａとこの中央片１９ａの三方を囲む挟持片１９ｂとを有する。挟持片１９ｂのの両側には垂直の溝１９ｃ，１９ｃが形成される。接着テープ１６の残部は、これを上方から見た場合に断面ハット状になるように、中央片１９ａと挟持片１９ｂとで挟み付けられ、ネジ１９ｄ，１９ｄで両片は合体する。中央片１９ａの存在により接着テープ１６の保護ケース側面への接着力が弱まる。この実施の形態では、第４の実施の形態と同一の図１５に示される取外し具３２が用いられ、第４の実施の形態と同様に保護ケース１１の着脱が行われる。

【００２０】

【発明の効果】以上述べたように、従来、保護ケース入りの盗難防止用タグを強力に商品の包装箱又は商品自体に貼着した後、商品が正規に購入された場合には、店員がタグを剥がすと、包装箱や商品自体が損傷したり、或いは接着剤が残存して、これらの見栄えを損っていたものが、本発明の接着面に対して約３５度以下の角度で引張ることにより剥離性を生じる引き伸し剥離接着テープを用いることにより、物品を万引する者に対しては物品を万引する者に対しては盗難防止用タグを物品から取外しにくく店員などの物品の取扱者にはこのタグを容易に物品から取外すことができる。また本発明の盗難防止用タグ及びその着脱方法によれば、剥がしたタグを上記引き伸し剥離接着テープで物品に接着すれば、再使用をすることができる利点もある。

【図面の簡単な説明】

【図１】第１の実施の形態の発明の盗難防止用タグの図２のＢ－Ｂ線断面図。

【図２】図１のＡ－Ａ線断面図。

【図３】両面接着テープを引張った状態の図２に相応する図。

【図４】図１の盗難防止用タグの斜視図。

【図５】第２の実施の形態の発明の盗難防止用タグの図１に相応する図。

【図６】図２に示した盗難防止用タグの接着テープを剥がすための取外し具の斜視図。

【図７】第３の実施の形態の発明の盗難防止用タグの接着テープ残部を接着する前の斜視図。

【図８】その接着テープ残部を接着した後の斜視図。

【図９】その接着テープ残部に引き伸し具を接着した状態を示す斜視図。

【図１０】第３の実施の形態の発明に用いる取外し具の斜視図。

【図１１】その取外し具を用いて引き伸し具を剥がす状況を示す図。

【図１２】その取外し具を用いて引き伸し具を接着テープとともに引張る状況を示す図。

【図１３】第４の実施の形態の発明に係る盗難防止用タグの平面図。

【図１４】その側面図。

【図１５】第４及び第５の実施の形態の発明に用いる取外し具の平面図。

【図１６】第５の実施の形態の発明に係る盗難防止用タグの平面図。

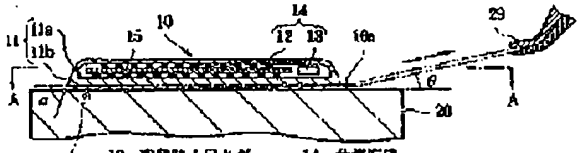
【図１７】図１６のＣ－Ｃ線要部断面図。

【図１８】本発明の盗難防止用タグ装置の構成図。

【符号の説明】

１０　盗難防止用タグ
１１　保護ケース
１２　アンテナコイル
１３　コンデンサ
１４　共振回路
１６　両面接着テープ
１６ａ　接着テープの引き伸し部
１６ｂ　接着テープの折返しループ部
１７，１８，１９　引き伸し具
２０　物品
２１　送信アンテナ
２９，３０，３１，３２　取外し具
３０ａ　先端部
３０ｂ　取付け部
３１ｄ，３２ｂ　係合部

【図1】



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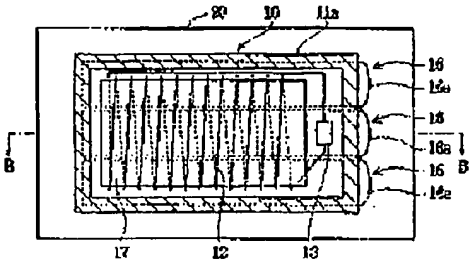

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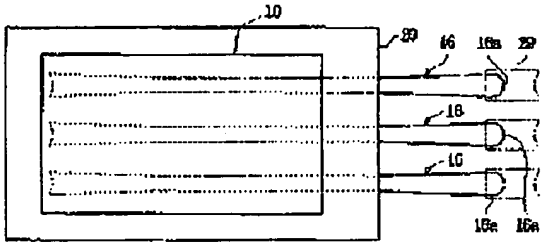

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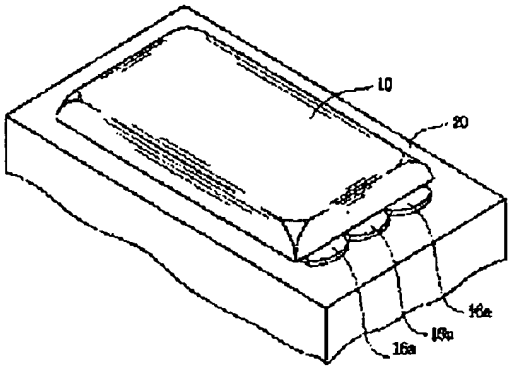

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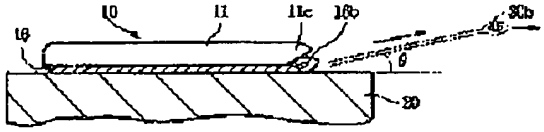
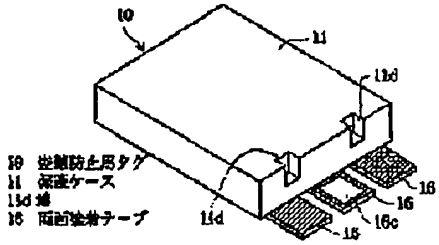


【図6】

【図7】



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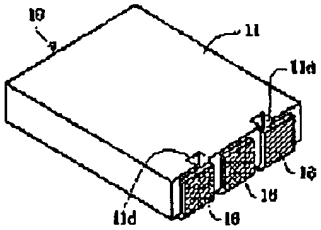

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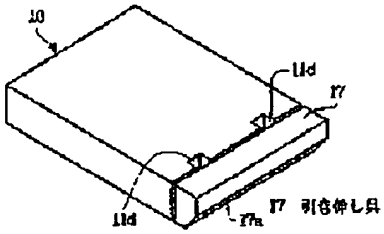

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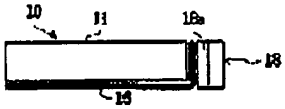

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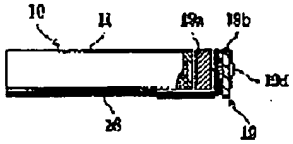

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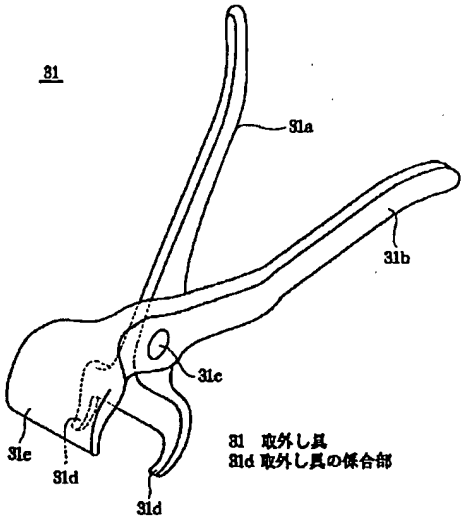

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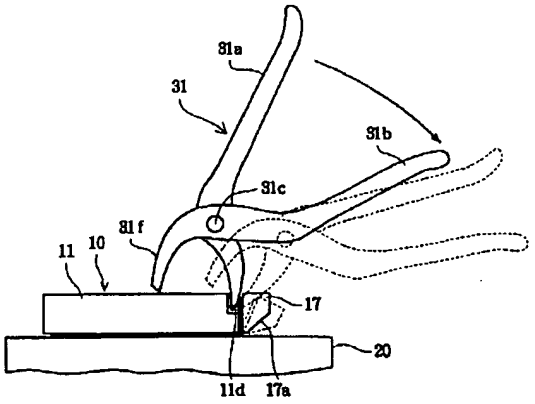

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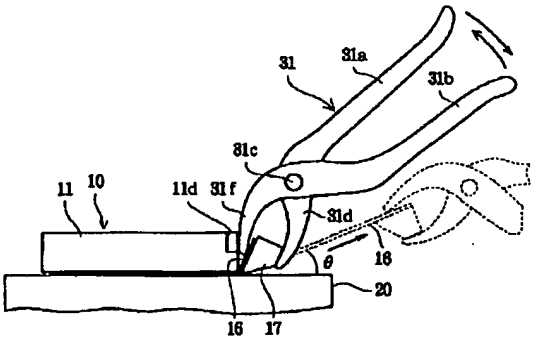

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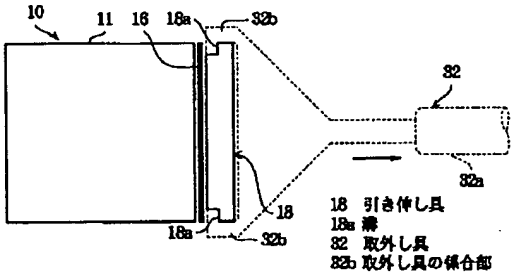

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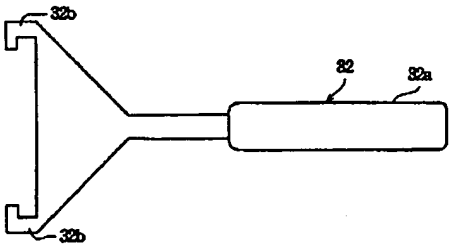

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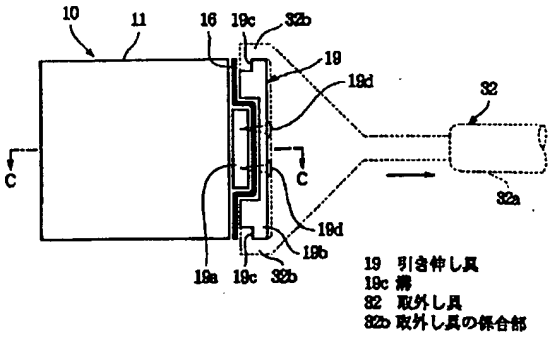
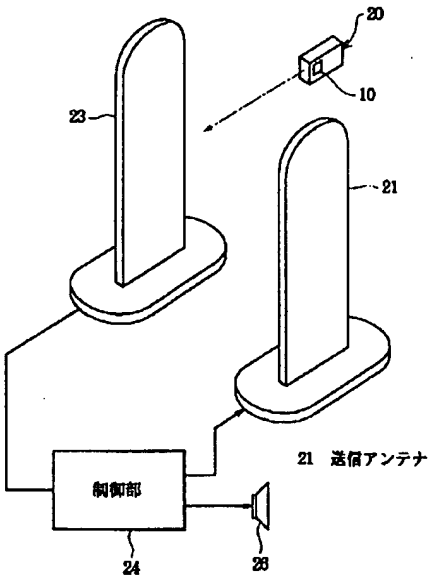


【図18】



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CLAIMS

[Claim(s)]
[Claim 1] In a tag the anti-theft equipped with the resonance circuit section (14) which resonates on the electric wave of the specific frequency which was held in the protective case (11), was attached in the goods for a theft monitor (20), and was transmitted from the transmitting antenna (21) -- business -- It is the enlargement exfoliation adhesive tape which separates from the both sides of said goods (20) and said protective case (11) by a double faced adhesive tape's (16)'s pasting the inferior surface of tongue of said protective case (11), and pulling at the include angle (theta) of about 35 or less degrees to an adhesion side. the anti-theft characterized by having the enlargement section (16a, 16b) of adhesive tape with a die length of 10mm or less when said double faced adhesive tape (16) attaches said protective case (11) in goods (20) -- business -- a tag.
[Claim 2] the anti-theft according to claim 1 whose radius-of-circle radius of the corner which the side face and top face of a protective case (11) make is 1/5 or more [of the thickness of said protective case (11)] -- business -- a tag.
[Claim 3] the anti-theft according to claim 1 or 2 whose include angle (alpha) which the side face and inferior surface of tongue of a protective case (11) make is 80 or less degrees -- business -- a tag.
[Claim 4] the anti-theft according to claim 1 or 2 by which enlargement exfoliation adhesive tape (16) was perpendicularly arranged by the inferior surface of tongue of a protective case (11) in the shape of a two or more strip of paper to the direction of enlargement -- business -- a tag.
[Claim 5] One principal plane of a double faced adhesive tape (16) is pasted up on the inferior surface of tongue of said protective case of a tag (10). the anti-theft by which the resonance circuit section (14) which resonates on the electric wave of the specific frequency transmitted from the transmitting antenna (21) was held in the protective case (11) -- business -- In the attachment-and-detachment approach of a tag the anti-theft which demounts said protective case (11) from said goods (20) after pasting up the principal plane of another side of said double faced adhesive tape (16) on the goods for a theft monitor (20) -- business -- It is the enlargement exfoliation adhesive tape which separates from the both sides of goods (20) and a protective case (11) when said double faced adhesive tape (16) pulls at the include angle (theta) of about 35 or less degrees to an adhesion side. One [of said double faced adhesive tape (16)] principal plane for the principal part is pasted up on the inferior surface of tongue of said protective case (11). The cuff loop-formation section (16b) of a tape with a flash die length of 5mm or less is prepared in the remainder of said double faced adhesive tape (16) protruded from the inferior surface of tongue of said protective case (11) when said protective case (11) was attached in goods (20) by said double faced adhesive tape (16). By [which demount, inserts the point (30b) of an ingredient (30), and pulls said double faced adhesive tape (16) at the include angle (theta) of about 35 or less degrees to an adhesion side] having been formed in said loop-formation section (16b) needlelike the anti-theft characterized by demounting said protective case (11) from said goods (20) -- business -- the attachment-and-detachment approach of a tag.
[Claim 6] One principal plane of a double faced adhesive tape (16) is pasted up on the inferior surface of tongue of said protective case of a tag. the anti-theft by which the resonance circuit section (14) which resonates on the electric wave of the specific frequency transmitted from the transmitting antenna (21) was held in the protective case (11) -- business -- In the attachment-and-detachment approach of a tag the anti-theft which demounts said protective case (11) from said goods (20) after pasting up the principal plane of another side of said double faced adhesive tape (16) on the goods for a theft monitor (11) -- business -- It is the enlargement exfoliation adhesive tape which separates from the both sides of goods (20) and a protective case (11) when said double faced adhesive tape (16) pulls at the include angle (theta) of about 35 or less degrees to an adhesion side. One [of said double faced adhesive tape (16)] principal plane for the principal part is pasted up on the inferior surface of tongue of said protective case (11). Extend in the remainder of said double faced adhesive tape (16) protruded from the inferior surface of tongue of said protective case (11) when said protective case (11) was attached in goods (20) by said double faced adhesive tape (16), and adjoin said protective case (11) and an ingredient (17, 18, 19) is attached. the anti-theft characterized by demounting said protective case (11) from said goods (20) by pulling said enlargement implement (17, 18, 19) at the include angle (theta) of about 35 or less degrees to an adhesion side with said double faced adhesive tape (16) -- business -- the attachment-and-detachment approach of a tag.
[Claim 7] the anti-theft according to claim 6 which pastes up one principal plane of the remainder of a double faced adhesive tape (16) on the side face of a protective case (11), extends to the principal plane of another side of said remainder, and pastes up an ingredient (17) -- business -- the attachment-and-detachment approach of a tag.
[Claim 8] the anti-theft according to claim 7 which constituted a part of one principal plane of the remainder of a double faced adhesive tape (16) so that it might be un-pasting up on the side face of a protective case (11) -- business -- the attachment-and-detachment approach of a tag.
[Claim 9] One or two or more slots (11d, 18a, 19c) are established in either or the both sides of the side face of the protective case (11) which one principal plane of the remainder of a double faced adhesive tape (16) pastes up, or an enlargement implement (17, 18, 19). Demount and said engagement section (31d, 32b) of an ingredient (31 32) is engaged with said slot (11d, 18a, 19c). it has the engagement section (31d, 32b) which can engage with said slot (11d, 18a, 19c) -- the anti-theft according to claim 7 or 8 which makes

said enlargement implement (17, 18, 19) exfoliate from the side face of a protective case (11) with said double faced adhesive tape (16) -- business -- the attachment-and-detachment approach of a tag.
[Claim 10] It has the engagement section (31d, 32b) which can engage with 1 or two or more slots (11d, 18a, 19c) which were established in either or the both sides of the side face of a protective case (11), or an enlargement implement (17, 18, 19). the anti-theft constituted so that said engagement section (31d, 32b) was extended in the condition of having engaged with said slot (11d, 18a, 19c), it might dissociate from a protective case (11) and an ingredient (17, 18, 19) might be pulled with a double faced adhesive tape (16) -- business -- the removal implement of a tag.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] the anti-theft which is easy to demount from goods to the operator of goods, such as a salesclerk, that it is hard to demount this invention from goods to those who shoplift goods about the tag for reporting the theft when goods, such as goods, are carried out without notice -- business -- it is related with a tag. Furthermore, it is related with the attachment-and-detachment approach of this tag, and its removal implement in detail.
[0002]
[Description of the Prior Art] the former and this kind of anti-theft -- business -- the anti-theft constituted so that the resonance circuit section of the tag attached in the goods for a theft monitor resonates on the electric wave of the specific frequency from an electric-wave sender, a separation detection means detects [whether a tag was separated from the goods for a theft monitor, and] as a tag and the separation information section may control an information sound output means based on the detection output of this separation detection means -- business -- a tag is indicated (JP,8-185584,A). this anti-theft -- business -- the resonance circuit section forms the conductive metallic foil of a predetermined configuration in both sides of the thin film of an insulating dielectric by etching etc., and consists of tags. For example, the front-face side flat-surface pattern of the capacitor which follows the coil section is formed in the coil section spirally formed in the thin film front face of the conductive metallic foil, and the spiral core of this coil section. A transmitting antenna and a receiving antenna open predetermined spacing mutually, and are set up by the entrance of the store which sells the goods for the above-mentioned theft monitor, and these antennas are electrically connected to a control section at it. A control section is constituted so that the signal level of the input signal from a receiving antenna may always be checked, while making the electric wave of the frequency which resonates in the resonance circuit section transmit from a transmitting antenna. Furthermore, the loudspeaker which emits an alarm is connected to the control output of a control section.
[0003] thus, the constituted anti-theft -- business -- the electric wave transmitted from the transmitting antenna when it was going to pass through between the transmitting antenna and the receiving antenna, having not liquidated with a tag the goods which are supervising the theft -- anti-theft -- since it resonates in the resonance circuit section of the tag attached in the goods of business, the input signal by which receiving level was modulated is received by the receiving antenna. Consequently, a control section emits an alarm from a loudspeaker and can prevent carrying out of non-liquidated goods. Those who try the shoplifter which knows existence of this tag are going to come out of a dealer, after demounting this tag. for this reason, the anti-theft held in protective cases, such as plastics, -- business -- a tag forms powerful adhesives in the inferior surface of tongue of a protective case, and is sticking them on the shipping box or the goods itself of goods.
[0004]
[Problem(s) to be Solved by the Invention] however, the anti-theft containing a protective case -- business -- if a salesclerk removes a tag when the tag was powerfully stuck on the shipping box or the goods itself of goods and goods are purchased by normal, a shipping box and the goods itself will be damaged, or adhesives will remain, and such appearance will be spoiled. Moreover, it becomes difficult for the removed tag to carry out a reuse.
[0005] the anti-theft which is easy to demount from goods to the operator of goods, such as a salesclerk, that it is hard to demount the purpose of this invention from goods to those who shoplift goods -- business -- it is in offering a tag. those from whom another purpose of this invention shoplifts goods -- receiving -- anti-theft -- business -- it is in providing the operator of goods, such as a salesclerk, with the attachment-and-detachment approach which can demount this tag from goods easily that it is hard to demount a tag from goods. the anti-theft which pasted up still more nearly another purpose of this invention on goods -- business -- it is in the thing which can demount a tag easily and for which it demounts and an ingredient is offered.
[0006]
[Means for Solving the Problem] In a tag 10 the anti-theft equipped with the resonance circuit section 14 which resonates on the electric wave of the specific frequency which was held in the protective case 11, was attached in the goods 20 for a theft monitor, and was transmitted from the transmitting antenna 21 as invention concerning claim 1 was shown in drawing 1 and drawing 18 -- business -- It is the enlargement exfoliation adhesive tape which separates from the both sides of goods 20 and a protective case 11 by a double faced adhesive tape's 16 pasting the inferior surface of tongue of a protective case 11, and pulling at the include angle theta of about 35 or less degrees to an adhesion side. the anti-theft characterized by having enlargement section 16a of adhesive tape with a die length of 10mm or less when a double faced adhesive tape 16 attaches a protective case 11 in goods 20 -- business -- it is a tag. Enlargement section 16a can be held, and is demounted, enlargement section 16a of adhesive tape is firmly held with an ingredient 29, and if adhesive tape 16 is pulled as shown in drawing 1 and drawing 3 , as for narrowing and adhesive tape 16, the width of face of adhesive tape will separate from the both sides of goods 20 and a protective case 11.
[0007] One principal plane of a double faced adhesive tape 16 is pasted up on the inferior surface of tongue of the protective case 11 of a tag 10. the anti-theft by which the resonance circuit section 14 which resonates on the electric wave of the specific frequency

transmitted from the transmitting antenna 21 as invention concerning claim 5 is shown in drawing 5 and drawing 6 was held in the protective case 11 -- business -- In the attachment-and-detachment approach of a tag the anti-theft which demounts a protective case 11 from goods 20 after pasting up the principal plane of another side of a double faced adhesive tape 16 on the goods 20 for a theft monitor -- business -- It is the enlargement exfoliation adhesive tape which separates from the both sides of goods 20 and a protective case 11 when a double faced adhesive tape 16 pulls at the include angle theta of about 35 or less degrees to an adhesion side. One [of a double faced adhesive tape 16] principal plane for the principal part is pasted up on the inferior surface of tongue of a protective case 11. Cuff loop-formation section 16b of a tape with a flash die length of 5mm or less is prepared in the remainder of the double faced adhesive tape 16 protruded from the inferior surface of tongue of a protective case 11 when a protective case 11 was attached in goods 20 by the double faced adhesive tape 16. It was formed in this loop-formation section 16b needlelike, demount, insert point 30b of an ingredient 30, and that anchoring section 30a and point 30b are held. the anti-theft characterized by demounting a protective case 11 from goods 20 by pulling a double faced adhesive tape 16 at the include angle theta of about 35 or less degrees to an adhesion side -- business -- it is the attachment-and-detachment approach of a tag. according to this approach, the tip was formed needlelike -- if it demounts and an ingredient 30 is not used -- adhesive tape 16 -- it cannot pull -- more -- certain -- anti-theft -- business -- the unapproved exfoliation from the goods 20 of a tag 10 can be prevented.

[0008] Invention concerning claim 10 has the engagement sections 31d and 32b which can engage with 1 or two or more slots 11d, 18a, and 19c which were established in either or the both sides of the side face of a protective case 11, or the enlargement implements 17, 18, and 19, as shown in drawing 12 - drawing 16 . the anti-theft constituted so that the engagement sections 31d and 32b were extended in the condition of having engaged with Slots 11d, 18a, and 19c, it might dissociate from a protective case 11 and ingredients 17, 18, and 19 might be pulled with a double faced adhesive tape 16 -- business -- they are the removal implements 31 and 32 of a tag. using these removal implements 31 and 32 -- the operator of goods like a salesclerk -- easy -- adhesive tape 16 -- it can pull -- anti-theft -- business -- a tag 10 can be exfoliated from goods 20.

[0009]

[Embodiment of the Invention] Next, the gestalt of operation of the 1st of this invention is explained. it is shown in drawing 1 and drawing 2 -- as -- anti-theft -- business -- a tag 10 has the protective case 11 of plastics, and the resonance circuit 14 which consists of a capacitor 13 connected to this protective case 11 to the both ends of antenna coil 12 and this antenna coil is held. A protective case 11 consists of top-cover 11a and base 11b. A double faced adhesive tape 16 is formed in the inferior surface of tongue of this protective case 11. The protective case 11 of a tag 10 is attached in the goods 20 for a theft monitor with this adhesive tape 16. Since the pressure sensitive adhesive is applied to adhesive tape 16, when pasting up, it pushes the protective case 11 against goods 20 by the force of a finger about about 30 seconds, so that it may mention later. Antenna coil 12 is rolled and formed in the magnetic core 15 which consists of tabular magnetic material in lead wire. Goods 20 are the expensive goods which can do carrying easily, for example. the gestalt of this operation shows to drawing 1 and drawing 4 -- as -- anti-theft -- business -- the radius-of-circle radius (corner radii) of the corner from which the side face and top face of that protective case 11 make a tag 10 -- the thickness of said protective case (11) -- 1/5 or more, it is formed so that it may become 2/3 or more preferably. It combines with making this radius-of-circle radius, or, as for this, it is desirable to form in 80 or less degrees the include angle alpha which the side face and inferior surface of tongue of a protective case 11 make independently. If this include angle alpha is 60 or less degrees, it is more desirable. Those who try a shoplifter by this stop being able to hold a protective case 11 easily, and unapproved exfoliation of a tag can prevent them further.

[0010] A double faced adhesive tape 16 is 10-20mm in width of face preferably, and it is still more desirable to be made in the shape of a strip of paper. By making it the shape of a strip of paper, adhesive tape 16 comes [elongation-] to be easy more and is desirable. The number when making it the shape of die length and a strip of paper of adhesive tape is decided according to the area of the inferior surface of tongue of a protective case, respectively. When the inferior surface of tongue of a protective case cannot finish being covered with one adhesive tape by the shape of a strip of paper, as for adhesive tape 16, it is desirable to arrange two or more in perpendicularly to the direction of enlargement. In drawing 1 , the adhesive tape 16 of the shape of three strip of paper has arranged. Moreover, adhesive tape 16 has enlargement section 16a of adhesive tape with a die length of 10mm or less, when a protective case 11 is attached in goods 20. It sets without preparing an adhesives layer in this enlargement section 16a. If the die length of enlargement section 16a exceeds 10mm, those who try a shoplifter can pull adhesive tape 16 with a finger, and are not desirable. It is 3-5mm preferably.

[0011] As shown in drawing 18 , a resonance circuit 14 resonates on the electric wave of the specific frequency transmitted from the transmitting antenna 21 set up by the entrance of a store. The transmitting antenna 21 and predetermined spacing are opened in this entrance, and a receiving antenna 23 is set up. A receiving antenna 23 is connected to the control input of a control section 24, and the transmitting antenna 21 is connected to the control output of a control section 24. Moreover, the loudspeaker 26 which emits an alarm is connected to the control output of a control section 24. A control section 24 is constituted so that the signal level of the input signal from a receiving antenna 23 may always be checked, while making the electric wave of the frequency which resonates in the resonance circuit section 14 transmit from the transmitting antenna 13. That is, if signal level when the direct receiving antenna 23 receives the electric wave transmitted from the transmitting antenna 13 is made into a reference value, the electric wave transmitted from the transmitting antenna 13 resonates in the resonance circuit section 14 of a tag 12 and a receiving antenna 23 receives, as for this signal level, only a predetermined value will become large from the above-mentioned reference value, but at this time, a control section 24 is constituted so that singing of the loudspeaker 26 may be carried out.

[0012] A double faced adhesive tape 16 is enlargement exfoliation adhesive tape shown in the ****** No. 507941 [eight to] official report and ****** No. 502213 [nine to] official report which have the property of separating from the both sides of goods 20 and a protective case 11 by pulling at the include angle theta of about 10 or less degrees preferably about 35 or less degrees to an adhesion side. When about 35 degrees is exceeded, pull strength stops attaining to the adhesive tape 16 whole, and adhesive tape 16 stops separating from the both sides of goods 20 and a protective case 11. This adhesive tape 16 is constituted by the pressure sensitive adhesive layer applied to both sides of a base material with a thickness of about 0.75mm - about 25mm and this base material. This base material has the consistency of about 15 lb. [about 10 lb./ft3 -]/ft3 including the layer of a polymer bubble, and/or the layer of

the polymer film of a solid as at least preferably as the elongation of about 50% - about 1200% of the die-length direction at the Young's modulus of 2500psi(s), and the time of fracture. In the layer of a polymer bubble, and/or the layer of the polymer film of a solid high density polyethylene, low density polyethylene, and a line -- low density polyethylene and a line -- the polyethylene containing super-low density polyethylene -- A vinyl copolymer like the polyolefine; polyvinyl chloride and polyvinyl acetate like polypropylene and polybutadiene; Ethylene / methacrylate copolymer, An olefin system copolymer; acrylic polymer like ethylene / vinyl acetate copolymer, acrylonitrile-butadiene-styrene copolymer, and ethylene/propylene copolymer, and an acrylic copolymer; polyurethane; and these combination are included. Moreover, the above-mentioned polymer may be plastics nature like polypropylene/polyethylene, polyurethane/polyolefine, polyurethane/polycarbonate, and polyurethane/polyester, and the mixture of the ingredient of elastomer nature or a compound is sufficient as it.

[0013] a pressure sensitive adhesive layer is measured by PSTC-1, PSTC-3, and ASTM D 903-83 by part for 12.7cm/in exfoliation rate -- having -- the exfoliation angle of 180 degrees -- it is -- about 4N/dm- it has the adhesion property which has about 200 N/dm in the range of about 25 N/dm - about 100 N/dm preferably. This pressure sensitive adhesive layer has the thickness of about 15 micrometers - about 1mm. In a pressure sensitive adhesive layer adhesive rubber cement; like natural rubber -- olefin; -- silicone; -- polyisoprene; -- synthetic rubber adhesive like polybutadiene; and styrene-isoprene-styrene -- The block copolymer of styrene-ethylene-butylene-styrene and styrene-styrene butadiene rubber, And adhesive or non-adhesive acrylic adhesives like the copolymer of iso octyl acrylate and an acrylic acid obtained by other synthetic elastomers; and radiation polymerization, solution polymerization, the suspension polymerization, or emulsion polymerization are contained.

[0014] When removing this protective case 11 after attaching a protective case 11 with adhesive tape 16 as shown in drawing 1 and drawing 3 , and a protective case 11 separates, where a protective case 11 is pushed against goods 20 with a finger etc., enlargement section 16a of a double faced adhesive tape 16 is extended, and it inserts with an ingredient 29, and pulls at the include angle theta of about 10 or less degrees preferably about 35 or less degrees to an adhesion side so that it may not fly with adhesive tape. Thereby, adhesive tape 16 elongates the width of face of that base material with slight straitness, and produces acute-angle type crack growth like destruction of a vitrified ingredient in a base material at this time. This crack growth causes brittle delaminate destruction of adhesives, this destruction takes place by few force according to each interface of adhesive tape 16, a protective case 11, and goods 20, and adhesive tape 16 separates finely, without [without it leaves the both sides of goods 20 and a protective case 11 the residue of a pressure sensitive adhesive, without that base material fracturing and] injuring the both sides of goods 20 and a protective case 11. Adhesive tape 16 does not return to an original configuration or an original dimension by the elastomer nature of a base material, after separating.

[0015] Next, based on drawing 5 and drawing 6 , the gestalt of operation of the 2nd of this invention is explained. About the configuration of a double faced adhesive tape 16, it is the same as that of the gestalt of the 1st operation. With the gestalt of this operation, as shown in drawing 5 , it is formed so that a part of periphery of a protective case 11 may ******, and adhesive tape 16 is formed in the inferior surface of tongue of a protective case 11 so that cuff loop-formation 16b of adhesive tape 16 may be arranged immediately under this overhang section 11c. That is, loop-formation 16b overflows the inferior surface of tongue of a protective case by die length of 5mm or less by return. It is 3-5mm preferably. With the gestalt of this operation, it is shown in drawing 6 , and demounts and an ingredient 30 is used. The removal implement 30 has point 30b formed needlelike and its anchoring section 30a. When removing this protective case 11 after attaching a protective case 11 with adhesive tape 16, a protective case 11 can be demounted from goods 20 by demounting to loop-formation section 16b, inserting point 30b of an ingredient 30, holding anchoring section 30a and point 30b, and pulling adhesive tape 16 at the include angle theta of about 35 or less degrees to an adhesion side.

[0016] Next, based on drawing 7 - drawing 12 , the gestalt of operation of the 3rd of this invention is explained. About the configuration of a double faced adhesive tape 16, it is the same as that of the gestalt of the 1st operation. With the gestalt of this operation, as shown in drawing 7 , the slots 11d and 11d on the pair are established in the upper limb of a protective case 11. One [of the strip-of-paper-like three double faced adhesive tapes 16] principal plane for the principal part is pasted up on the inferior surface of tongue of this protective case 11. An adhesives layer is prepared also in both sides of the remainder of this adhesive tape 16. To one side of the remainder of the adhesive tape 16 of middle, piece-of-paper 16c is stuck and the adhesive strength to the protective case side face of the enlargement implement 17 mentioned later is weakened. Subsequently, as shown in drawing 8 , when a protective case 11 is attached in goods (not shown) by the double faced adhesive tape 16, one principal plane of the remainder of the double faced adhesive tape 16 overflowing from the inferior surface of tongue of a protective case 11 is pasted up on the side face of a protective case 11. Next, as shown in drawing 9 , it extends to the principal plane of another side of this remainder, and an ingredient 17 is pasted up. The number of the slots 11d and 11d of a top Norikazu pair any one, and they may be established in the enlargement implement 17. The lower side of the enlargement implement 17 by the side of un-pasting up is inclined plane 17a so that it may be easy to fall, when an enlargement implement is removed.

[0017] Drawing 10 pulls and demounts this enlargement implement 17, and shows an ingredient 31. Nothing and two arms 31a and 31b are supported pivotably by supporting-point 31c in a configuration [like grip BASAMI] whose removal implement 31 is. The tip of arm 31a is divided into two forks, and the tip of arm 31b has become a configuration like shovel 31e. A forked tip serves as the engagement sections 31d and 31d, and these spacing is equal to above-mentioned slots [11d and 11d] spacing, and has 31d of engagement sections, and 31d of width of face which can be inserted in Slots 11d and 11d. By grasping so that the arms 31a and 31b of each other may be close brought like the usual scissors, Points 31d and 31d and shovel 31e extend the removal implement 31, and it can grasp an ingredient 17 now (drawing 12). In addition, it is made configurations, such as not a square that illustrates the configuration of the Slots [11d and 11d] cross section but a trapezoid, a triangle, and a hemicycle, and if it demounts and engagement sections [31d and 31d] the configuration and dimension of the cross section of an ingredient 31 are made the same with the configuration of the cross section of 11d of this slot, and the dimension, respectively, unless this removal implement 31 will be used, it can make it possible not to remove a protective case 11 by any means. As shown in drawing 11 , after extending to the principal plane of another side of the remainder of adhesive tape 16 and pasting up an ingredient 17, it demounts, the points 31d and 31d of an ingredient 31 are inserted in Slots 11d and 11d, arm 31a is pushed down in the direction of an arrow head, and the enlargement

implement 17 is removed from the side face of a protective case 11, as shown in a broken line. Since piece-of-paper 16c shown in drawing 7 was made to intervene between adhesive tape and a protective case side face, an operation of TEKO of the removal implement 31 is also added and the enlargement implement 17 separates easily. Subsequently, it demounts, as shown in drawing 12 , and it extends by the points 31d and 31d of an ingredient 31, and shovel 31e, and an ingredient 17 is held, and if tension and adhesive tape 16 develop as shown in the broken line of drawing, a protective case 11 will separate from goods 20 like the gestalt of said operation.

[0018] Next, based on drawing 13 - drawing 15 , the gestalt of operation of the 4th of this invention is explained. About the configuration of a double faced adhesive tape 16, it is the same as that of the gestalt of the 1st operation. Moreover, the approach to the protective case 11 of the enlargement implement 18 "cling" is the same as that of the gestalt of the 3rd operation. With the gestalt of this operation, it extends, as shown in drawing 13 and drawing 14 , and the perpendicular slots 18a and 18a are formed in the both sides of an ingredient 18. With the gestalt of this operation, it is shown in drawing 15 , and demounts and an ingredient 32 is used. The removal implement 32 has the engagement sections 32b and 32b fixed to Toride 32a and this Toride. The engagement sections 32b and 32b are formed in the L character-like hook of a pair. When removing this protective case 11 after attaching a protective case 11 with adhesive tape 16, the engagement sections 32b and 32b are made to engage with Slots 18a and 18a from the upper part, and it pulls in the direction of the arrow head of drawing 13 . If adhesive tape 16 develops, a protective case 11 will separate from goods 20 like the gestalt of said operation. In addition, if a piece of paper etc. is inserted into the adhesive tape side of the side pasted up on the side face of a protective case 11 like the gestalt of the 3rd operation at this time and the non-adhesion part is made, the enlargement implement 18 can be easily removed from a protective case 11.

[0019] Furthermore, based on drawing 16 and drawing 17 , the gestalt of operation of the 5th of this invention is explained. About the configuration of a double faced adhesive tape 16, it is the same as that of the gestalt of the 1st operation. Moreover, the approach to the protective case 11 of the enlargement implement 18 "cling" is the same as that of the gestalt of the 3rd operation. With the gestalt of this operation, it extends, as shown in drawing 16 and drawing 17 , and an ingredient 19 has piece of pinching 19b surrounding Mikata of central piece 19a and this central piece 19a. The perpendicular slots 19c and 19c are formed in the both sides of piece of pinching 19b **. It is inserted by central piece 19a and piece of pinching 19b, and both pieces coalesce with Screws 19d and 19d so that it may become cross-section hat-like, when the remainder of adhesive tape 16 looks at this from the upper part. The adhesive strength to the protective case side face of adhesive tape 16 becomes weaker by existence of central piece 19a. With the gestalt of this operation, it is shown in the same drawing 15 as the gestalt of the 4th operation, and demounts, an ingredient 32 is used, and attachment and detachment of a protective case 11 are performed like the gestalt of the 4th operation.

[0020]

[Effect of the Invention] it stated above -- as -- the anti-theft containing the former and a protective case -- business, when goods are purchased by normal after sticking a tag on the shipping box or the goods itself of goods powerfully If a salesclerk removes a tag, a shipping box and the goods itself are damaged or adhesives remain. By using the enlargement exfoliation adhesive tape with which what had spoiled such appearance produces detachability by pulling at the include angle of about 35 or less degrees to the adhesion side of this invention those who shoplift goods to those who shoplift goods -- receiving -- anti-theft -- business -- the operator of goods, such as a salesclerk, can demount this tag from goods easily that it is hard to demount a tag from goods. moreover, the anti-theft of this invention -- business -- if the tag which was removed according to a tag and its attachment-and-detachment approach is pasted up on goods with the above-mentioned enlargement exfoliation adhesive tape, there is also an advantage which can carry out a reuse.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] the anti-theft of invention of the gestalt of the 1st operation -- business -- the B-B line sectional view of drawing 2 of a tag.
[Drawing 2] The A-A line sectional view of drawing 1 .
[Drawing 3] Drawing which ****s in drawing 2 in the condition of having pulled the double faced adhesive tape.
[Drawing 4] the anti-theft of drawing 1 -- business -- the perspective view of a tag.
[Drawing 5] the anti-theft of invention of the gestalt of the 2nd operation -- business -- drawing which ****s in drawing 1 of a tag.
[Drawing 6] the anti-theft shown in drawing 2 -- business -- the perspective view of the removal implement for removing the adhesive tape of a tag.
[Drawing 7] the anti-theft of invention of the gestalt of the 3rd operation -- business -- the perspective view before pasting up the adhesive tape remainder of a tag.
[Drawing 8] The perspective view after pasting up the adhesive tape remainder.
[Drawing 9] The perspective view showing the condition of having extended in the adhesive tape remainder and having pasted up the ingredient.
[Drawing 10] It uses for invention of the gestalt of the 3rd operation, demounts, and is the perspective view of an ingredient.
[Drawing 11] Drawing showing the situation of extending using the removal implement and removing an ingredient.
[Drawing 12] Drawing showing the situation which extends using the removal implement and pulls an ingredient with adhesive tape.
[Drawing 13] the anti-theft concerning invention of the gestalt of the 4th operation -- business -- the top view of a tag.
[Drawing 14] The side elevation.
[Drawing 15] It uses for invention of the gestalt of the 4th and the 5th operation, demounts, and is the top view of an ingredient.
[Drawing 16] the anti-theft concerning invention of the gestalt of the 5th operation -- business -- the top view of a tag.
[Drawing 17] The C-C line important section sectional view of drawing 16 .
[Drawing 18] the anti-theft of this invention -- business -- the block diagram of tag equipment.
[Description of Notations]
10 Anti-theft -- Business -- Tag
11 Protective Case
12 Antenna Coil
13 Capacitor
14 Resonance Circuit
16 Double Faced Adhesive Tape
16a The enlargement section of adhesive tape
16b The cuff loop-formation section of adhesive tape
17, 18, 19 Enlargement implement
20 Article
21 Transmitting Antenna
29, 30, 31, 32 It demounts and is an ingredient.
30a Point
30b Anchoring section
31d, 32b Engagement section

[Translation done.]

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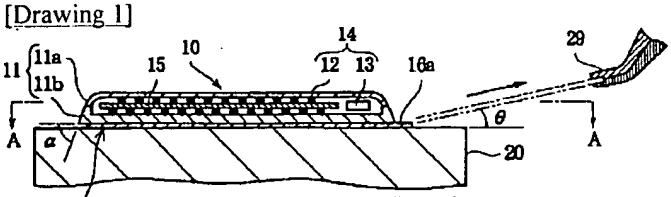
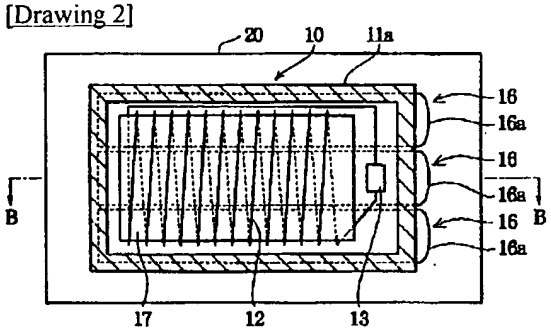
3.In the drawings, any words are not translated.

DRAWINGS

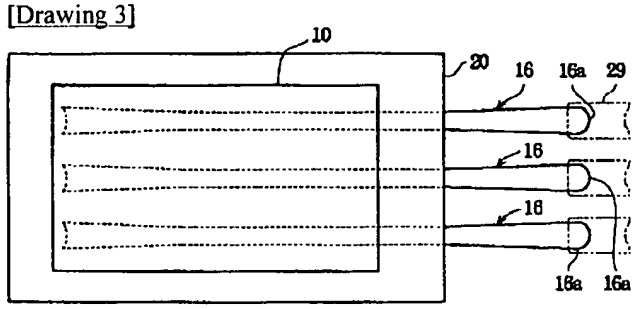
[Drawing 1]



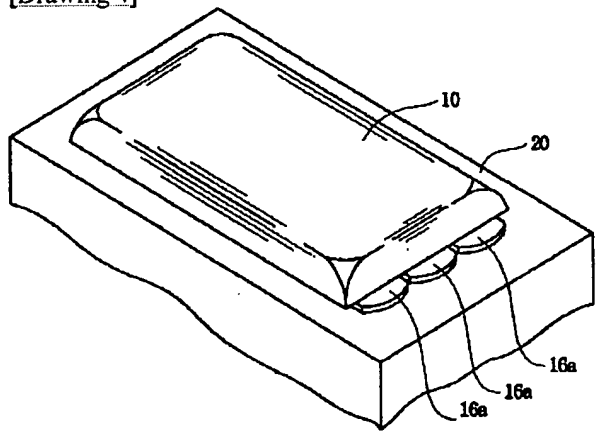
[Drawing 2]



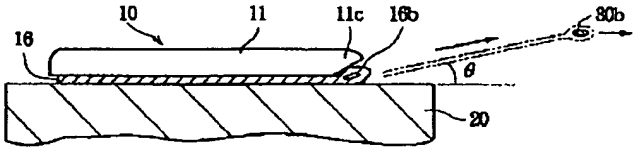
[Drawing 3]



[Drawing 4]

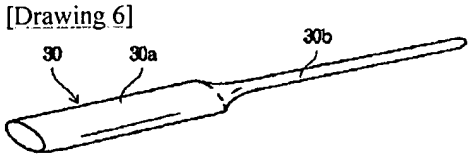


[Drawing 5]

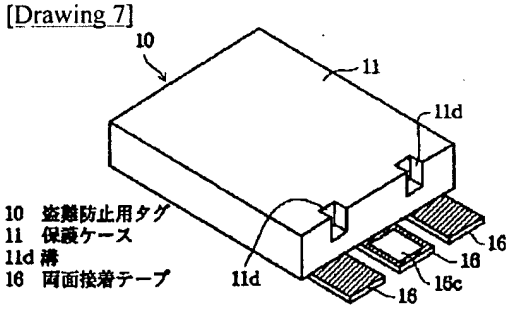


10 盗難防止用タグ
11 保護ケース
16 両面接着テープ
16b 接着テープの折返しループ部
30b 取外し具の先端部

[Drawing 6]

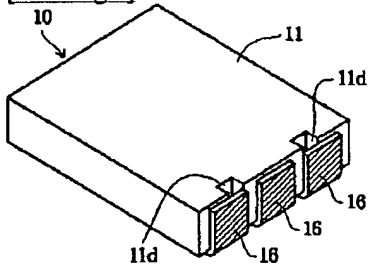


[Drawing 7]

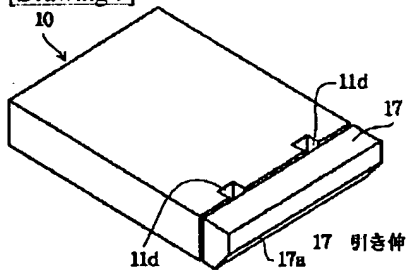


10 盗難防止用タグ
11 保護ケース
11d 溝
16 両面接着テープ

[Drawing 8]

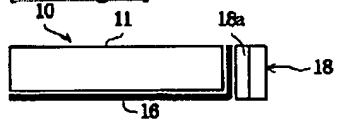


[Drawing 9]

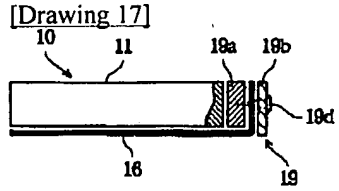


17 引き伸し具

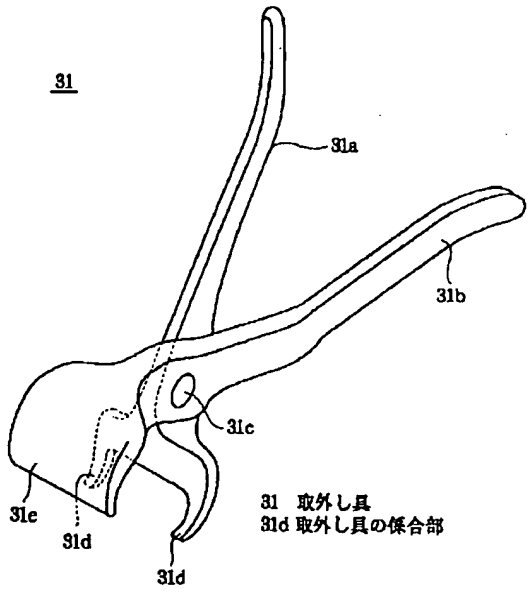
[Drawing 14]



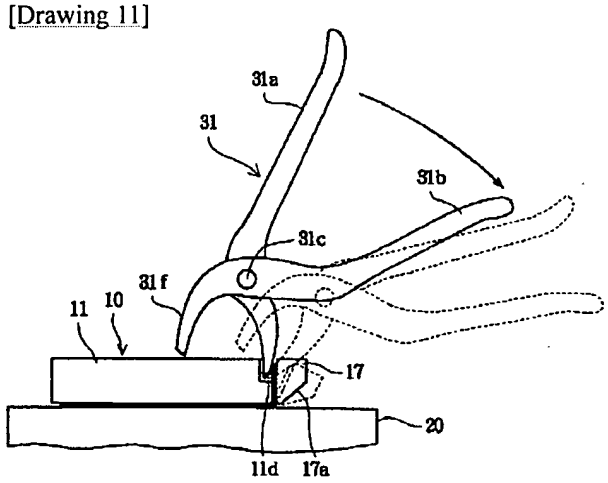
[Drawing 17]



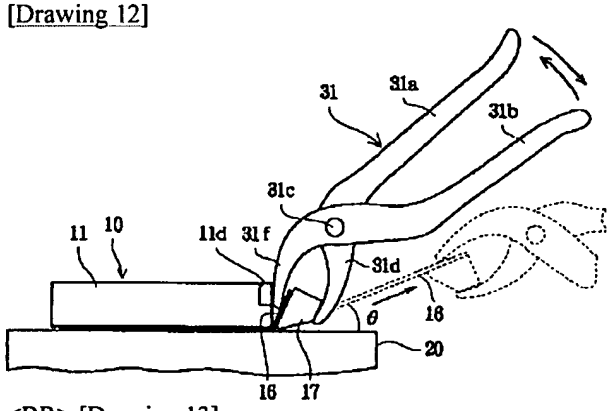
[Drawing 10]



[Drawing 11]



[Drawing 12]



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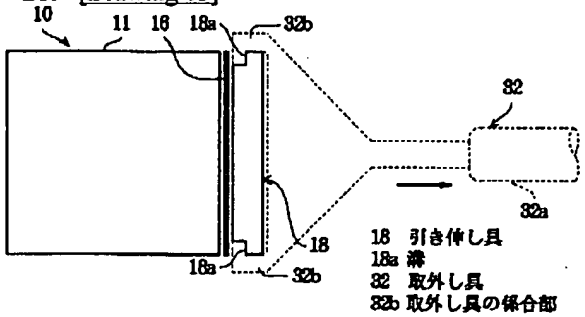
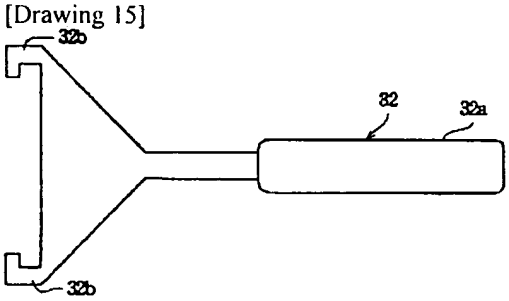
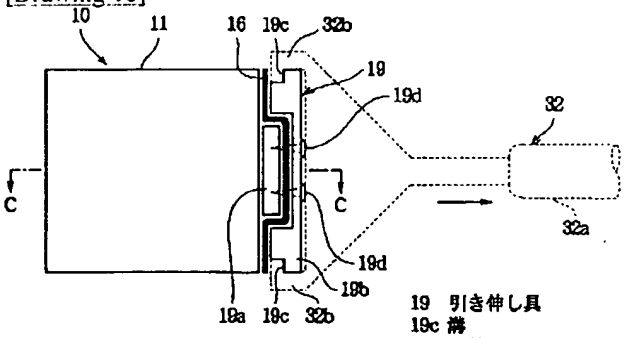


[Drawing 15]

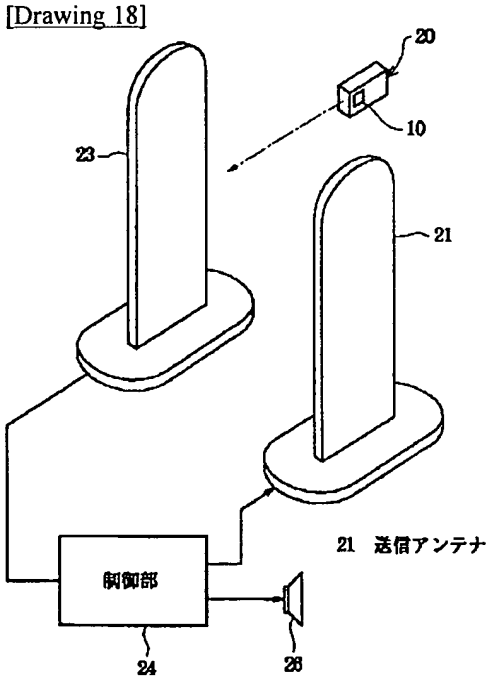


[Drawing 16]



19 引き伸し具
19c 溝
32 取外し具
32b 取外し具の係合部

[Drawing 18]



21 送信アンテナ

[Translation done.]

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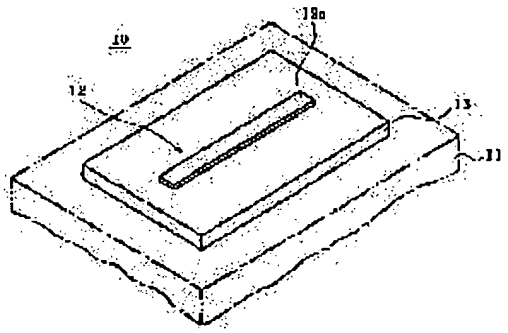
YONEZAWA MASA

(54) TAG FOR PREVENTING THEFT

(57) Abstract:
PROBLEM TO BE SOLVED: To provide a tag for preventing theft which is short in length, small in size, light in weight, small in thickness and difficult to be conspicuous and is produced at a low cost.
SOLUTION: The tag for preventing theft 10 is provided with a resonance circuit part 12 fitted to an article 11 for monitoring theft and resonating to the radio waves of a specific frequency (f) at the time of receiving that. The part 12 includes a conductor 12a functioning as an antenna to the specific frequency (f), which is a frequency selected from a quasi-microwave band, a microwave band or a millimeter wave band equal to or higher than 800 MHz. The part 12 is formed on the upper surface of an insulated base material sheet 13 and the lower surface of the base material sheet becomes the fixing surface of an article.



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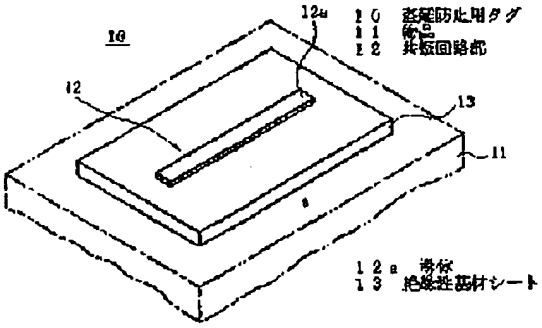
最終頁に続く

(54)【発明の名称】　盗難防止用タグ

(57)【要約】
【課題】　短小軽薄にして目立ちにくく安価に製造できる。高感度である上、指向性を持たせて他のタグとの相互干渉を防ぐことができる。金属製を含む他のいかなる材質の物品に対しても盗難防止機能を有する。
【解決手段】　盗難防止用タグ１０は盗難監視用の物品１１に取付けられ特定周波数ｆの電波を受信するとこれに共振する共振回路部１２を備える。共振回路部１２が特定周波数ｆに対してアンテナとして機能する導体１２ａを含み、この特定周波数ｆは８００ＭＨｚ以上の準マイクロ波帯、マイクロ波帯又はミリメートル波帯から選ばれた周波数である。共振回路部１２は絶縁性基材シート１３の上面に形成され、基材シートの下面が物品の取付面となる。



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【特許請求の範囲】

【請求項１】　盗難監視用の物品(11)に取付けられ特定周波数(f)の電波を受信するとこれに共振する共振回路部(12)を備えた盗難防止用タグにおいて、

前記共振回路部が前記特定周波数(f)に対してアンテナとして機能する導体(12a)を含み、前記特定周波数(f)が８００ＭＨｚ以上の準マイクロ波帯、マイクロ波帯又はミリメートル波帯から選ばれた周波数であることを特徴とする盗難防止用タグ。

【請求項２】　絶縁性基材シート(13)と、この基材シート(13)の上面に形成された共振回路部(12)とを備え、前記基材シート(13)の下面が物品(11)の取付面となる請求項１記載の盗難防止用タグ。

【請求項３】　絶縁性基材シート(13)と、この基材シート(13)の上面に形成された共振回路部(12)と、この基材シート(13)の下面に形成された金属薄膜(15)とを備え、前記金属薄膜(15)が物品(11)の取付面となる請求項１記載の盗難防止用タグ。

【請求項４】　物品(11)又は前記物品の包装材が絶縁性材料からなり、前記物品又は包装材の表面に共振回路部(12)が直接形成された請求項１記載の盗難防止用タグ。

【請求項５】　共振回路(12)を構成する導体(12a)が金属パターンで形成された請求項１ないし４いずれか記載の盗難防止用タグ。

【請求項６】　共振回路(12)を構成する導体(12a)が整合負荷用の抵抗値を有する導体パターンである請求項１ないし４記載の盗難防止用タグ。

【請求項７】　共振回路(12)が金属パターンで形成された導体(12a)とこの導体に接続された整合負荷用の固定抵抗(12b)とにより構成された請求項５記載の盗難防止用タグ。

【請求項８】　共振回路(12)が金属パターンで形成された導体(12a)とこの導体に接続された半導体素子とにより構成された請求項５記載の盗難防止用タグ。

【請求項９】　共振回路(12)が互いに間隔をあけて形成された配列方向が同一又は異なる複数の導体(12a,12a)を含む請求項１ないし８いずれか記載の盗難防止用タグ。

【請求項１０】　複数の共振回路が互いに間隔をあけて設けられ、前記複数の共振回路の共振周波数が互いに異なる請求項１ないし９いずれか記載の盗難防止用タグ。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、商品等の物品が無断で持ち出されたときにその盗難を報知するためのタグに関するものである。

【０００２】

【従来の技術】従来、この種の盗難防止用タグとして、盗難監視用の物品に取付けられたタグの共振回路部が電波発信装置からの特定周波数の電波に共振し、タグが盗

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難監視用の物品から分離されたか否かを分離検知手段が検出し、この分離検知手段の検出出力に基づいて分離報知部が報知音出力手段を制御するように構成された盗難防止用タグが開示されている（特開平８－１８５５８４）。この盗難防止用タグでは、共振回路部が絶縁性誘電体の薄膜の両面にエッチング等により所定形状の導電性金属箔を形成して構成される。例えば、薄膜表面に、導電性金属箔により渦巻状に形成されたコイル部と、このコイル部の渦巻状の中心部にコイル部に連続するコンデンサの表面側平面パターンとが形成される。上記盗難監視用の物品を販売する店の出入り口には、送信アンテナと受信アンテナとが互いに所定の間隔をあけて立設され、これらのアンテナは制御部に電気的に接続される。制御部は共振回路部で共振する周波数の電波を送信アンテナから送信させるとともに、受信アンテナからの受信信号の信号レベルを常にチェックするように構成される。更に制御部の制御出力には警報を発するスピーカが接続される。

【０００３】このように構成された盗難防止用タグでは、盗難を監視している物品が未清算のまま送信アンテナ及び受信アンテナ間を通過しようとすると、送信アンテナから送信された電波が盗難防止用の物品に取付けられたタグの共振回路部で共振するため、受信アンテナには受信レベルの変調された受信信号が受信される。この結果、制御部はスピーカから警報を発し、未清算商品の持ち出しを防止できる。物品の清算が終了した場合には、店員がタグに強力な電磁波を掛けてコンデンサを破壊しタグを作動させないようにしたり、或いは警報スピーカを一時的に停止したりして警報が発せられないようになっている。

【０００４】

【発明が解決しようとする課題】しかし、上記従来の盗難防止用タグでは、共振のために使用する周波数は通常８．２ＭＨｚの短波帯であるため、共振回路部はコイル部とコンデンサを必要とする。この結果、従来の盗難防止用タグは薄層化するには限度があり、かさばって目立ちやすい上、コイル部を形成するために複雑な工程を要し、これが製造コストを押上げていた。またタグの感度が十分でなく、他のタグとの相互干渉を生じやすかった。更に表面がアルミニウム等の導電性材料や鋼板等の磁性材料により形成された金属製物品にタグを取付けると、共振回路部の自己インダクタンスが変化するため、表面が絶縁性材料により形成された物品にタグを取付けた場合と比較して、共振回路部の共振周波数が変わってしまい、盗難防止用タグとして適さない不具合があった。

【０００５】本発明の目的は、短小軽薄にして目立ちにくく安価に製造できる盗難防止用タグを提供することにある。本発明の別の目的は、高感度である上、指向性を持たせて他のタグとの相互干渉を防ぐことができる盗難

防止用タグを提供することにある。本発明の別の目的は、金属製を含む他のいかなる材質の物品に対しても盗難防止機能を有するタグを提供することにある。

【0006】

【課題を解決するための手段】請求項1に係る発明は、図1及び図17に示すように、盗難監視用の物品11に取付けられ特定周波数fの電波を受信するとこれに共振する共振回路部12を備えた盗難防止用タグにおいて、共振回路部12が特定周波数fに対してアンテナとして機能する導体12aを含み、この特定周波数fが800MHz以上の準マイクロ波帯、マイクロ波帯又はミリメートル波帯から選ばれた周波数であることを特徴とする盗難防止用タグ10である。請求項2に係る発明は、請求項1に係る発明であって、図1に示すように絶縁性基材シート13と、この基材シート13の上面に形成された共振回路部12とを備え、基材シート13の下面が物品11の取付面となる盗難防止用タグ10である。従来の8.2MHzの短波帯の周波数と異なり、800MHz以上のより短い波長の周波数を特定周波数とすることから、共振回路部12を構成する導体12aを従来のようにコイル状に形成することなく、導体長Lを波長に関連した長さにするだけで特定周波数fに対してアンテナとしての機能を具備することができる。

【0007】請求項3に係る発明は、請求項1に係る発明であって、図2に示すように絶縁性基材シート13と、この基材シート13の上面に形成された共振回路部12と、この基材シートの下面に形成された金属薄膜15とを備え、金属薄膜15が物品11の取付面となる盗難防止用タグ10である。従来の盗難防止用タグでは物品11が導電性材料又は磁性材料などの金属製である場合には、共振回路部の自己インダクタンスが変化してその共振周波数が変わることにより正常な動作をしなかったものが、本発明では特定周波数fを800MHz以上の非常に波長の短い電波を用いているため、いわゆるマイクロ波の伝送線路で形成されたアンテナの形式を採用することができる。即ち、請求項3に係る盗難防止用タグは、金属薄膜15を接地板としたアンテナの構成をとることができる。この発明の場合、接地用の金属薄膜15により金属製物品や金属製包装材の影響を受けることがなく、タグ10は正常に動作する。

【0008】

【発明の実施の形態】次に本発明の実施の形態について説明する。本発明の共振回路部を構成する導体は特定周波数に対してアンテナとして機能する。この特定周波数は、後述するようにタグに要求される大きさに従って、800MHz以上の準マイクロ波帯（800～3GHz）、マイクロ波帯（3～30GHz）、ミリメートル波帯（30～300GHz）の範囲から選ばれる。周波数が高い程、タグは小型化できる。本発明の導体は、共振周波数である特定周波数が800MHz以上の準マイクロ波帯より高い周波数であるため、実用的な大きさの金属パターン又は導体パターンで形成することができる。この導体の大きさは通常1／2波長程度の大きさとなる。導体の周囲の媒質の誘電率を高くすれば、より小型化することができる。本発明の下限の周波数800MHzでは、次式（1）により自由空間の波長は約38cmとなり、この長さの導体を共振回路部とした盗難防止用タグが得られる。

【0009】

【数1】

$$f = \frac{8\times10^{10}\,cm}{800\times10^{6}\,Hz} = 37.5\,cm \fallingdotseq 38\,cm \quad \cdots\cdots (1)$$

【0010】また周波数800MHzの1／2波長では約20cm、1／4波長では約10cmとなり、この長さの導体を共振回路部とすれば、実用的な大きさの盗難防止用タグが得られる。更に周波数を上げていけばタグはより小型になる。例えば周波数10GHzでは波長は3cm（1／2波長では1.5cm）、60GHzでは波長は5mm（1／2波長では2.5mm）となり、タグは極めて小さくなる。

【0011】導体は、アンテナとして機能させるために、線状、方形状、円形状等の各種の形状で形成される。線状導体には一直線状のもの（図1～図4）、開ループ状のもの（図5～図9）、閉ループ状のもの（図10）が挙げられる。またアンテナの機能向上のために整合付きのもの（図11）や接地板付きのもの（図12～図16）が挙げられる。

【0012】(a) 線状導体（線状アンテナ）を有するタグ

① 一直線状導体を有するタグ

図1に示される盗難防止用タグ10は、長方形の紙、プラスチックなどからなる絶縁性基材シート13上に一直線状の導体パターンで作られた導体12aが形成される。この絶縁性基材シート13の厚さはアンテナを形成できれば、その値は任意であるが、30μm～3mm程度が適当であり、通常1mm以下である。30μm未満では材料を選定しても耐久性に乏しく、3mmを越えると本発明の目的である軽薄短小のタグを実現できなくなる。本発明の範囲の特定周波数の電波は指向性を有するため、図2及び図3に示すように線状導体12aを間隔をあけて複数設け、これらの配列方向を互いに異なるようにすることが好ましい。また図2に示すように、感度を向上するために複数の線状導体12aをその配列方向をそれぞれ同一にして配置してもよい。図4に示すように、導体12aを外傷から保護するために、絶縁性基材シート13上の導体12aを別の絶縁性カバーシート1

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4で被覆してもよい。これらの絶縁性基材シート及び絶縁性カバーシートはポリエチレンテレフタレート、ポリプロピレン、塩化ビニールなどの材料で作られる。

【0013】② 閉ループ状導体を有するタグ

図5～図9に示すように導体12aが閉ループ状の場合には、導体12aはその長さ、即ち周の長さが特定周波数fの1波長となるように作られる。導体（線路）の幅は波長に比べて十分に小さくしている。この幅は波長の1／8以下が好ましい。図5は円環状導体（円環状アンテナ）、図6は長円状導体（長円状アンテナ）、図7は楕円状導体（楕円状アンテナ）、図8は正方形状導体（正方形状アンテナ）、及び図9は長方形状導体（長方形状アンテナ）の例をそれぞれ示す。

【0014】③ 開ループ状導体を有するタグ

図10に示すように導体12aが開ループ状の場合には、導体12aはその長さ、即ち周の長さが特定周波数fの1波長となるように作られる。導体（線路）の幅は波長に比べて十分に小さくすることは閉ループ状導体の場合と同じである。

【0015】(b) 整合付き導体（整合付きアンテナ）を有するタグ

上述した(a)の線状導体のアンテナでも特定周波数fに反応させることができ、盗難防止用タグとして機能し得るが、更にアンテナの機能を向上させるためには整合用負荷を付け加えることが効果的である。図11は共振回路部12が負荷抵抗付き半波長ダイポールアンテナの例を示す。この共振回路部12は金属パターンで形成された導体12aと整合負荷用の固定抵抗12bとにより構成される。具体的には全長Lの1／2波長の金属パターン12aの中央部を切除し、固定抵抗12bを挿入した構造である。自由空間（空気）中に置かれたアンテナの場合、固定抵抗12bの値は約75Ω（正確には73.13Ω）が適当な値となる。この抵抗値は導体であるアンテナ12aが置かれる周囲の媒質によって変化し、例えば誘電率が3程度の媒質中に置いた場合には約50Ωが適当となる。

【0016】図11では金属パターンに固定抵抗を接続した例を示したが、この抵抗は印刷による抵抗でも、金属パターン自体に抵抗を付与した導体パターンでもよい。その場合には外観上、抵抗部分は見られず、図1～図9に示した一直線状導体及び閉ループ状導体となる。更に図11の例では固定抵抗により負荷を形成したが、半導体素子（図示せず）で負荷を形成してもよい。特にICの半導体素子で負荷を形成した場合には、ICメモリにタグを取付けた物品に関連したデータ等を記憶させることにより、色々な機能を持たせたタグを形成することができる。

【0017】(c) 接地板付き導体（接地板付きアンテナ）を有するタグ

上述した(a)線状導体及び(b)整合付き導体は独立した金

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属線やパターンで形成したが、図12～図16に示すように、導体をアンテナとしてより有効に機能させるために、絶縁性基材シート13の下面全体又は下面全体と上面の一部に接地用の金属薄膜15を形成してもよい。金属薄膜15はアルミニウム、銅等の導電性材料を主体とし、表皮の厚さδ以上（3倍程度）の厚さを有することが好ましい。なお、表皮の厚さδは次の式（2）により与えられる。ここで、ωは角周波数（$2\pi f$）、σは導電率、μは透磁率である。

【0018】

【数2】

$$\delta = \sqrt{\frac{2}{\omega \sigma \mu}} \qquad \cdots\cdots (2)$$

【0019】① 線状導体（線状アンテナ）を有するタグ

図12は導体12aをマイクロ波の伝送線路としたマイクロストリップ線路であって、誘電体である絶縁性基材シート13の下面全体に接地板としての金属薄膜15が形成される。図中黒丸印部分は給電点であって、整合負荷を付ける場合の整合負荷の取付位置の一例を示す。図13は導体12aをマイクロ波の伝送線路としたコプレーナ線路であって、誘電体である絶縁性基材シート13の下面全体及び導体12aの両側の上面に接地板としての金属薄膜15が形成される。図14は導体12aをマイクロ波の伝送線路としたトリプレート線路であって、導体12a誘電体であるシート13及び14でサンドイッチした上、絶縁性基材シート13の下面全体及び絶縁性カバーシート14の上面全体に接地板としての金属薄膜15が形成される。

【0020】② 面状導体（面状アンテナ）を有するタグ

図15は長方形状の導体12aを、また図16は円形状の導体12aをそれぞれマイクロ波の伝送線路としたマイクロストリップ線路であって、誘電体である絶縁性基材シート13の下面全体に接地板としての金属薄膜15が形成される。図中黒丸印部分は給電点であって、整合負荷を付ける場合の整合負荷の取付位置の一例を示す。導体が方形の場合には長い辺が、また円形の場合にはその直径がそれぞれ特定周波数fの1波長、1／2波長、1／4波長等に相当する。

【0021】(d) 絶縁性基材シートなしのタグ

図示しないが、本発明の盗難防止用タグは、図1に示した絶縁性基材シートがなくてもよい。即ち、タグを取付ける物品又はこの物品の包装材が絶縁性材料からなる場合には、物品又は包装材の表面に共振回路部を直接形成して盗難防止用タグとすることができる。例えば導体の裏面に接着層とその上に剥離紙を積層し、タグを取付けるときには、剥離紙を剥いで物品又は包装材に直接接着

する。別の方法としては、導体を導体パターンとして印刷機により導電性インクを物品又は宝蔵材の表面に直接印刷することにより形成することもできる。この導電性インクに抵抗性材料を混合して印刷し、導体パターンがアンテナの整合負荷用の抵抗値を有するようにしてもよい。

【0022】正規に支払いを済ませた商品等の物品を持った買い物客が図17に示す送信アンテナ21と受信アンテナ22の間を通過しても警報を発しないようにするための手段として、(1) 導体表面をスクラッチして機械的に破壊する方法、(2) 導体表面に金属箔を貼り付ける方法、(3) 半導体素子付きタグの場合には半導体素子内のメモリを書き換えるか、或いはスイッチを切り換える方法、及び(4) 図11に示した抵抗付きタグの場合には抵抗部分を極く細い線で作ったり、或いは一部を細くして、強い電流で細い部分を溶断する方法などのタグを無効化する方法が挙げられる。

【0023】更に本発明の盗難防止用タグは複数の共振回路を備え、これらの共振回路の共振周波数が互いに異なるようにしてもよい。例えば、1つの共振回路部の共振周波数は本発明の800MHz以上の準マイクロ波帯、マイクロ波帯又はミリメートル波帯から選ばれた周波数とし、他の共振回路部の共振周波数は従来の8.2MHzとしてもよい。これにより従来の盗難防止用タグ装置にも反応するタグとすることができる。

【0024】

【実施例】次に本発明の実施例について説明する。

<実施例1>一直線状導体を有する盗難防止用タグを作製した。たて15cm、よこ5cm、厚さ0.3mmの塩化ビニールからなる絶縁性基材シート上に幅約1mm、長さ約10cmのアルミニウム製の金属パターンを印刷して導体を形成することによりタグを得た。

【0025】<実施例2>たて15cm、よこ2cm、厚さ0.3mmの大きさの実施例1と同一材質の絶縁性基材シートを用意し、実施例1と同一材質の導体を幅約1mm、長さ約3cmの大きさに形成した以外は、実施例1と同様にして盗難防止用タグを作製した。

【0026】<実施例3>たて10mm、よこ3mm、厚さ0.3mmの大きさの実施例1と同一材質の絶縁性基材シートを用意し、実施例1と同一材質の導体を幅約0.5mm、長さ約5mmの大きさに形成した以外は、実施例1と同様にして盗難防止用タグを作製した。

【0027】<実施例4>負荷抵抗付き半波長ダイポールアンテナ型の導体の共振回路部からなる盗難防止用タグを作製した。即ち、実施例2の基材シート上の長さ約3cmの導体の中央部を切除し、切除した箇所に約75Ωのチップ型固定抵抗の両端をはんだ付けすることによりタグを得た。

【0028】<評価試験>図17に示す盗難防止用タグ装置を用いて、実施例1～実施例4のタグが正常に機能するか否か試験した。この装置では送信アンテナ21と受信アンテナ22とが互いに所定の間隔をあけて立設され、これらのアンテナ21、22は制御部24に電気的に接続される。制御部24はタグ10の共振回路部12（図1）で共振する特定周波数fの電波を送信アンテナ21から送信させるとともに、受信アンテナ22からの受信信号の信号レベルを常にチェックするように構成される。制御部24の制御出力には警報を発するスピーカ26が接続される。この試験では制御部24により発信アンテナ21から特定周波数fとして、800MHz、10GHz、60GHzの周波数をそれぞれ受信アンテナ22に向けて送信した。一方、実施例1～実施例4の盗難防止用タグを鋼鉄製のケースに接着し、これらのタグを発信アンテナ21と受信アンテナ22の間通過させて、スピーカ26から警報を発するか否か確認した。その結果、実施例1のタグは周波数800MHzの電波で、実施例2及び実施例4のタグは周波数10GHzの電波で、更に実施例3のタグは周波数60GHzの電波で、それぞれ共振回路部に共振現象が僅かに見られ、受信アンテナには微弱ながらも受信レベルの変調された受信信号が受信されて、それぞれスピーカ26からかすかに警報が発せられた。これにより、タグを取付ける部分が鋼鉄製であっても、共振周波数は変化しないことが判った。タグの構造及び受信装置を改良すれば、実用的な盗難防止用タグが実現できることが確証された。

【0029】

【発明の効果】以上述べたように、本発明によれば、共振周波数である特定周波数を800MHz以上の準マイクロ波帯、マイクロ波帯又はミリメートル波帯の周波数から選ぶため、共振回路部をこの特定周波数に対してアンテナとして機能する単純な導体により構成し、短小軽薄にして目立ちにくい盗難防止用タグにすることができる。従来の盗難防止用タグのように共振回路部にコイルを要しないため、製造コストが安価で済む。また特定周波数を800MHz以上の周波数とすることから、高感度である上、指向性を持たせて他のタグとの相互干渉を防ぐことができる。更に従来の8.2MHzの周波数を共振周波数とした盗難防止用タグでは、盗難監視用の物品のタグを取付ける部分が金属製である場合には共振回路部の共振周波数が変化して正常に機能しなかったものが、本発明の金属薄膜を有するタグでは800MHz以上の周波数を共振周波数としこの金属薄膜を接地板とすることから、金属製を含む他のいかなる材質の物品又はその包装材に対しても盗難防止機能を有し、対象物品を選ばないほぼ万能の盗難防止用タグを実現できる。

【図面の簡単な説明】

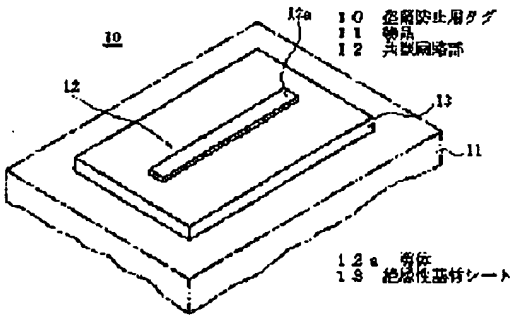
【図1】請求項1又は2に係る発明の盗難防止用タグの斜視図。

【図2】請求項9に係る発明の互いに配列方向の異なる4本の導体を含む盗難防止用タグの平面図。

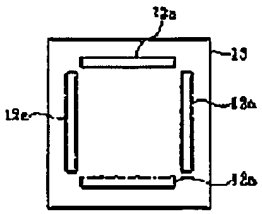
【図3】請求項9に係る発明の互いに配列方向の異なる2本の導体を含む盗難防止用タグの平面図。
【図4】本発明の絶縁性カバーシート付きの盗難防止用タグの断面図。
【図5】本発明の円環状の閉ループ線状導体の共振回路部からなる盗難防止用タグの平面図。
【図6】本発明の長円状の閉ループ線状導体の共振回路部からなる盗難防止用タグの平面図。
【図7】本発明の楕円状の閉ループ線状導体の共振回路部からなる盗難防止用タグの平面図。
【図8】本発明の正方形状の閉ループ線状導体の共振回路部からなる盗難防止用タグの平面図。
【図9】本発明の長方形状の閉ループ線状導体の共振回路部からなる盗難防止用タグの平面図。
【図10】本発明の長円状の開ループ線状導体の共振回路部からなる盗難防止用タグの平面図。
【図11】本発明の負荷抵抗付き半波長ダイポールアンテナ型の導体の共振回路部からなる盗難防止用タグの平面図。
【図12】本発明の絶縁性基材シートの下面全体に金属薄膜を接地板として有するマイクロストリップ線路型の導体の共振回路部からなる盗難防止用タグの斜視図。
【図13】本発明の絶縁性基材シートの下面全体及び上面一部に金属薄膜を接地板として有するコプレーナ線路＊型の導体の共振回路部からなる盗難防止用タグの斜視図。
【図14】本発明の絶縁性基材シートの両面全体に金属薄膜を接地板として有するトリプレート線路型の導体の共振回路部からなる盗難防止用タグの斜視図。
【図15】本発明の長方形状の面状導体の共振回路部からなる盗難防止用タグの平面図。
【図16】本発明の円形状の面状導体の共振回路部からなる盗難防止用タグの平面図。
【図17】本発明の盗難防止用タグ装置の構成図。

【符号の説明】
10　盗難防止用タグ
11　物品
12　共振回路部
12a　導体
12b　固定抵抗
13　絶縁性基材シート
14　絶縁性カバーシート
15　金属薄膜
21　送信アンテナ
22　受信アンテナ
24　制御部
26　スピーカ

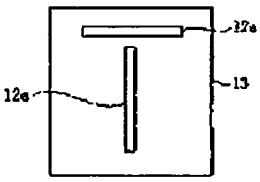
【図1】



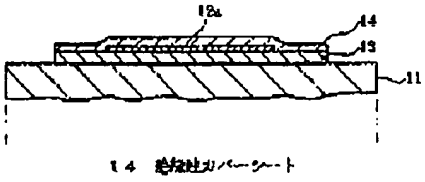
【図2】



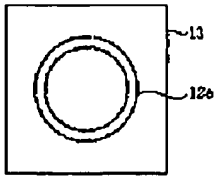
【図3】



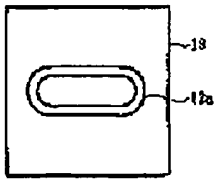
【図4】



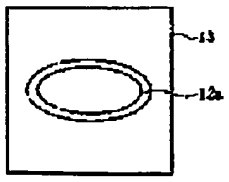
【図5】



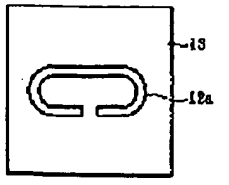
【図6】



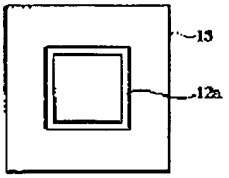
【図7】



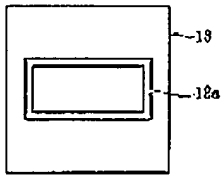
【図10】



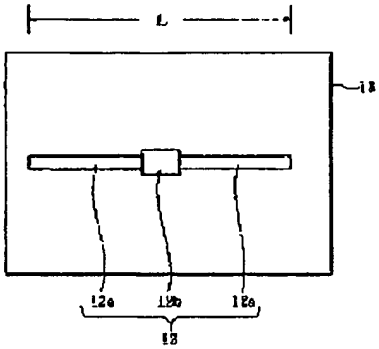
【図8】



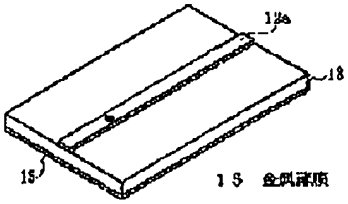
【図9】



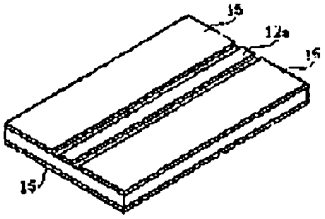
【図11】



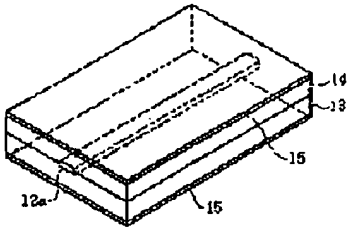
【図12】



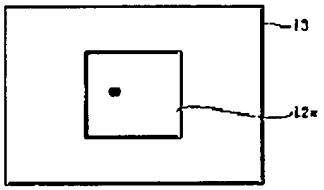
【図13】



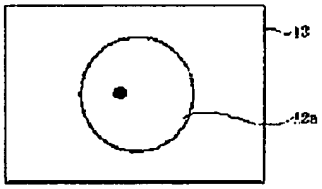
【図14】



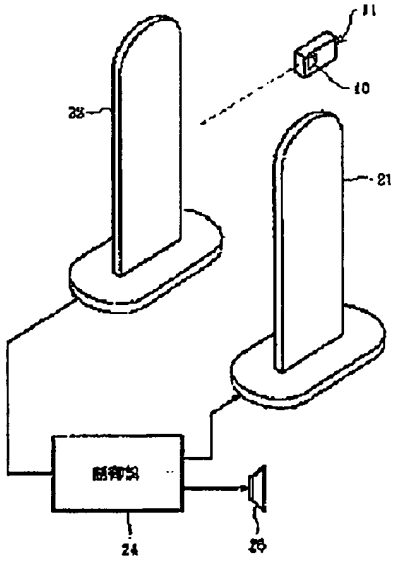
【図15】



【図16】



【図17】



フロントページの続き

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CLAIMS

[Claim(s)]
[Claim 1] In a tag the anti-theft equipped with the resonance circuit section (12) which will resonate to this if it is attached in the goods for a theft monitor (11) and the electric wave of a specific frequency (f) is received -- business -- the anti-theft characterized by being the frequency as which said specific frequency (f) was chosen from a semi- microwave band, a microwave band, or a millimetric wave band 800MHz or more including the conductor (12a) on which said resonance circuit section functions as an antenna to said specific frequency (f) -- business -- a tag.
[Claim 2] the anti-theft according to claim 1 from which it has the resonance circuit section (12) formed in the top face of an insulating base material sheet (13) and this base material sheet (13), and the inferior surface of tongue of said base material sheet (13) turns into a clamp face of goods (11) -- business -- a tag.
[Claim 3] the anti-theft according to claim 1 from which it has the metal thin film (15) formed in the inferior surface of tongue of an insulating base material sheet (13), and the resonance circuit section (12) formed in the top face of this base material sheet (13) and this base material sheet (13), and said metal thin film (15) serves as a clamp face of goods (11) -- business -- a tag.
[Claim 4] the anti-theft according to claim 1 by which the resonance circuit section (12) was directly formed in the front face of said goods or a packing material by the packing material of goods (11) or said goods consisting of an insulating ingredient -- business -- a tag.
[Claim 5] claim 1 in which the conductor (12a) which constitutes a resonance circuit (12) was formed by the metal pattern thru/or 4 -- either -- the anti-theft of a publication -- business -- a tag.
[Claim 6] the anti-theft of claim 1 whose conductor (12a) which constitutes a resonance circuit (12) is the conductor pattern which has the resistance for matched loads thru/or four publications -- business -- a tag.
[Claim 7] the anti-theft according to claim 5 constituted by the fixed resistance for matched loads (12b) by which the resonance circuit (12) was connected to the conductor (12a) formed by the metal pattern, and this conductor -- business -- a tag.
[Claim 8] the anti-theft according to claim 5 constituted by the semiconductor device by which the resonance circuit (12) was connected to the conductor (12a) formed by the metal pattern, and this conductor -- business -- a tag.
[Claim 9] that the array direction in which the resonance circuit (12) opened spacing in mutually, and was formed is the same or claim 1 containing two or more different conductors (12a, 12a) thru/or 8 -- either -- the anti-theft of a publication -- business -- a tag.
[Claim 10] claim 1 from which two or more resonance circuits open spacing mutually, and are prepared, and the resonance frequency of two or more of said resonance circuits differs mutually thru/or 9 -- either -- the anti-theft of a publication -- business -- a tag.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the tag for reporting the theft, when goods, such as goods, are carried out without notice.
[0002]
[Description of the Prior Art] the former and this kind of anti-theft -- business -- the anti-theft constituted so that the resonance circuit section of the tag attached in the goods for a theft monitor resonates on the electric wave of the specific frequency from an electric-wave sender, a separation detection means detects [whether a tag was separated from the goods for a theft monitor, and] as a tag and the separation information section may control an information sound output means based on the detection output of this separation detection means -- business -- a tag is indicated (JP,8-185584,A). this anti-theft -- business -- the resonance circuit section forms the conductive metallic foil of a predetermined configuration in both sides of the thin film of an insulating dielectric by etching etc., and consists of tags. For example, the front-face side flat-surface pattern of the capacitor which follows the coil section is formed in the coil section spirally formed in the thin film front face of the conductive metallic foil, and the spiral core of this coil section. A transmitting antenna and a receiving antenna open predetermined spacing mutually, and are set up by the entrance of the store which sells the goods for the above-mentioned theft monitor, and these antennas are electrically connected to a control section at it. A control section is constituted so that the signal level of the input signal from a receiving antenna may always be checked, while making the electric wave of the frequency which resonates in the resonance circuit section transmit from a transmitting antenna. Furthermore, the loudspeaker which emits an alarm is connected to the control output of a control section.
[0003] thus, the constituted anti-theft -- business -- the electric wave transmitted from the transmitting antenna when it was going to pass through between the transmitting antenna and the receiving antenna, having not liquidated with a tag the goods which are supervising the theft -- anti-theft -- since it resonates in the resonance circuit section of the tag attached in the goods of business, the input signal by which receiving level was modulated is received by the receiving antenna. Consequently, a control section emits an alarm from a loudspeaker and can prevent carrying out of non-liquidated goods. When liquidation of goods is completed, a salesclerk imposes a powerful electromagnetic wave on a tag, a capacitor is destroyed, it is made not to operate a tag, or an alarm loudspeaker is stopped temporarily, and an alarm is emitted.
[0004]
[Problem(s) to be Solved by the Invention] however, the above-mentioned conventional anti-theft -- business -- with a tag, since the frequency used for resonance is usually a 8.2MHz short wave band, the resonance circuit section needs the coil section and a capacitor. consequently, the conventional anti-theft -- business -- when a tag had a limit in carrying out lamination, and it was bulky and easy to be conspicuous, in order to form the coil section, the complicated process was required, and this was pushing up the manufacturing cost. Moreover, the sensibility of a tag is not enough and tended to produce a mutual intervention with other tags. furthermore, the case where a tag is attached in the goods in which the front face was formed with the insulating ingredient since the self-inductance of the resonance circuit section will change, if a tag is attached in the metal goods in which the front face was formed with magnetic materials, such as conductive ingredients, such as aluminum, and a steel plate, -- comparing -- the resonance frequency of the resonance circuit section -- changing -- anti-theft -- business -- there was fault for which it is not suitable as a tag.
[0005] the anti-theft which can be manufactured cheaply that it is made insincere small [the purpose of this invention], and is hard to be conspicuous -- business -- it is in offering a tag. the anti-theft which another purpose of this invention can give directivity when it is high sensitivity, and can prevent a mutual intervention with other tags -- business -- it is in offering a tag. Another purpose of this invention is to offer the tag which has an anti-theft function to the goods of any quality of the materials of the others containing metal.
[0006]
[Means for Solving the Problem] In a tag the anti-theft equipped with the resonance circuit section 12 which will resonate to this if invention concerning claim 1 is attached in the goods 11 for a theft monitor and receives the electric wave of the specific frequency f as shown in drawing 1 and drawing 17 -- business -- the conductor on which the resonance circuit section 12 functions as an antenna to the specific frequency f -- the anti-theft characterized by being the frequency as which this specific frequency f was chosen from a semi- microwave band, a microwave band, or a millimetric wave band 800MHz or more including 12a -- business -- it is a tag 10. the anti-theft from which invention concerning claim 2 is invention concerning claim 1, it has the insulating base material sheet 13 and the resonance circuit section 12 formed in the top face of this base material sheet 13 as shown in drawing 1 , and the inferior surface of tongue of the base material sheet 13 turns into a clamp face of goods 11 -- business -- it is a tag 10. the conductor which constitutes the resonance circuit section 12 since a frequency with a shorter wavelength of 800MHz or more is made into a specific frequency unlike the frequency of the 8.2MHz conventional short wave band -- without it forms 12a in a coiled form like before -- a conductor -- the function as an antenna can be provided to the specific frequency f only by making Merit L into the die length relevant to wavelength.
[0007] the anti-theft from which invention concerning claim 3 is invention concerning claim 1, it has the insulating base material sheet

13, the resonance circuit section 12 formed in the top face of this base material sheet 13, and the metal thin film 15 formed in the inferior surface of tongue of this base material sheet as shown in drawing 2 , and the metal thin film 15 serves as a clamp face of goods 11 -- business -- it is a tag 10. the conventional anti-theft -- business -- with a tag, when goods 11 be metal, such as a conductive ingredient or a magnetic material, what did not carry out normal actuation when the self-inductance of the resonance circuit section changed and the resonance frequency changed can adopt the format of the antenna formed in the specific frequency f in the so-called transmission line of a microwave since the electric wave 800MHz or more with very short wavelength be used in this invention. namely, the anti-theft concerning claim 3 -- business -- a tag can take the configuration of the antenna which used the metal thin film 15 as the earth plate. In this invention, it is not influenced of the packing material made from a metal goods metallurgy group with the metal thin film 15 for touch-down, and a tag 10 operates normally.

[0008]

[Embodiment of the Invention] Next, the gestalt of operation of this invention is explained. The conductor which constitutes the resonance circuit section of this invention functions as an antenna to a specific frequency. This specific frequency is chosen from the range of a semi- microwave band (800-3GHz) 800MHz or more, a microwave band (3-30GHz), and a millimetric wave band (30-300GHz) according to the magnitude required of a tag as mentioning later. A tag can be miniaturized, so that a frequency is high. Since the specific frequency which is resonance frequency is a frequency higher than a semi- microwave band 800MHz or more, the conductor of this invention can be formed with the metal pattern or conductor pattern of practical magnitude. The magnitude of this conductor usually turns into about 1/2 wave of magnitude. If the dielectric constant of the medium around a conductor is made high, it can miniaturize more. the anti-theft which the wavelength of free space was set to about 38cm by the degree type (1), and made the conductor of this die length the resonance circuit section on the frequency of 800MHz of the minimum of this invention -- business -- a tag is obtained.

[0009]

[Equation 1]

$$f = \frac{3\times10^{10}\,cm}{800\times10^{6}\,Hz} = 37.5\,cm \fallingdotseq 38\,cm \quad \cdots\cdots (1)$$

[0010] moreover -- 1/2 wave with a frequency of 800MHz -- about 20cm and quarter-wave length -- about 10cm -- becoming -- the conductor of this die length -- the resonance circuit section, then the anti-theft of practical magnitude -- business -- a tag is obtained. Furthermore, if the frequency is raised, a tag will become small more. For example, on the frequency of 10GHz, wavelength is set to 5mm (1/2 wave 2.5mm) by wavelength in 3cm (1/2 wave 1.5cm) and 60GHz, and a tag becomes very small.

[0011] In order to operate a conductor as an antenna, it is formed in various kinds of configurations, such as the shape of a line and a rectangle, and a circle configuration. a line -- a straight line-like thing (drawing 1 - drawing 4), a closed-loop-like thing (drawing 5 - drawing 9), and an open loop-like thing (drawing 10) are mentioned to a conductor. Moreover, a thing with adjustment (drawing 11) and a thing with an earth plate (drawing 12 - drawing 16) are mentioned for the improvement in functional of an antenna.

[0012] (a) a line -- the shape of a tag ** straight line which has a conductor (line antenna) -- the anti-theft shown in tag drawing 1 which has a conductor -- business -- the conductor made from the straight line-like conductor pattern on the insulating base material sheet 13 with which a tag 10 consists of rectangular paper, plastics, etc. -- 12a is formed. Although that value is arbitrary if the thickness of this insulating base material sheet 13 can form an antenna, 30 micrometers - about 3mm is suitable, and is usually 1mm or less. Even if it selects an ingredient, when it is lacking in endurance and 3mm is exceeded, it becomes impossible to realize the small and light tag which is the purpose of this invention in less than 30 micrometers. since the electric wave of the specific frequency of the range of this invention has directivity, it is shown in drawing 2 and drawing 3 -- as -- a line -- a conductor -- it is desirable to open spacing, to prepare two or more 12a, and to make these array directions differ mutually. moreover, two or more lines as shown in drawing 2 , in order to improve sensibility -- a conductor -- the array direction may be made the same, respectively and 12a may be arranged. it is shown in drawing 4 -- as -- a conductor -- in order to protect 12a from a trauma -- the conductor on the insulating base material sheet 13 -- 12a may be covered with another insulating cover sheet 14. These insulating base material sheets and an insulating cover sheet are made from ingredients, such as polyethylene terephthalate, polypropylene, and vinyl chloride.

[0013] ** the shape of a closed loop -- it is shown in tag drawing 5 which has a conductor - drawing 9 -- as -- a conductor -- the case where 12a is a closed loop-like -- a conductor -- 12a is made so that the die length, i.e., the circumferential die length, may become one wave of the specific frequency f. Width of face of a conductor (track) is made small enough compared with wavelength. As for this width of face, 1/8 or less [of wavelength] is desirable. drawing 5 is in a circle -- a conductor (antenna in a circle) and drawing 6 -- the shape of an ellipse -- a conductor (ellipse-like antenna) and drawing 7 -- the shape of an ellipse -- a conductor (ellipse-like antenna) and drawing 8 -- the shape of a square -- a conductor (square-like antenna) and drawing 9 -- the shape of a rectangle -- the example of a conductor (rectangle-like antenna) is shown, respectively.

[0014] ** the shape of an open loop -- it is shown in tag drawing 10 which has a conductor -- as -- a conductor -- the case where 12a is a closed loop-like -- a conductor -- 12a is made so that the die length, i.e., the circumferential die length, may become one wave of the specific frequency f. making width of face of a conductor (track) small enough compared with wavelength -- the shape of a closed loop -- it is the same as the case of a conductor.

[0015] (b) with adjustment -- the line of (a) which has a conductor (antenna with adjustment) and which carried out tag **** -- it reacts to the specific frequency f also with the antenna of a conductor -- it can make -- anti-theft -- business -- although it may function as a tag, in order to raise the function of an antenna further, it is effective to add the load for adjustment. As for drawing 11 , the resonance circuit section 12 shows the example of a half-wave length dipole antenna with load resistance. the conductor in which this resonance circuit section 12 was formed by the metal pattern -- it is constituted by 12a and fixed-resistance 12b for matched loads. It is the structure which specifically excised 1/2 wave of center section of metal pattern 12a of an overall length L, and inserted fixed-resistance 12b. In the case of the antenna placed all over free space (air), the value of fixed-resistance 12b turns into a value with

suitable about 75 ohms (correctly 73.13ohms). When this resistance changes with the media of the perimeter on which antenna 12a which is a conductor is put, for example, it places into the medium whose dielectric constant is about three, about 50 ohms becomes suitable.

[0016] Although drawing 11 showed the example which connected fixed resistance to the metal pattern, the conductor pattern with which resistance by printing also gave resistance to the metal pattern itself is sufficient as this resistance. the shape of in that case, a straight line which the exterior and the resistance part were not looked at but was shown in drawing 1 - drawing 9 -- the shape of a conductor and a closed loop -- it becomes a conductor. Furthermore, although the load was formed by fixed resistance in the example of drawing 11 , a load may be formed by the semiconductor device (not shown). When a load is formed especially by the semiconductor device of IC, the tag which gave various functions can be formed by making the data relevant to the goods which attached the tag in the IC memory etc. memorize.

[0017] (c) with an earth plate -- (a) which has a conductor (antenna with an earth plate) and which carried out tag **** -- a line -- a conductor and with (b) adjustment -- although the conductor was formed by the isolated metal wire and the isolated pattern, as shown in drawing 12 - drawing 16 , in order to operate a conductor more effectively as an antenna, the metal thin film 15 for touch-down may be formed in a part of the whole inferior surface of tongue or the whole inferior surface of tongue, and the top face of the insulating base material sheet 13. As for the metal thin film 15, it is desirable to make conductive ingredients, such as aluminum and copper, into a subject, and to have the thickness more than thickness delta of epidermis (about 3 times). In addition, thickness delta of epidermis is given by the following formula (2). Here, omega is angular frequency (2pif) and sigma is conductivity, mu is permeability.

[0018]

[Equation 2]

$$\delta = \sqrt{\frac{2}{\omega \sigma \mu}} \qquad \cdots\cdots (2)$$

[0019] ** a line -- tag drawing 12 which has a conductor (line antenna) -- a conductor -- it is the microstrip line which made 12a the transmission line of microwave, and the metal thin film 15 as an earth plate is formed in the whole inferior surface of tongue of the insulating base material sheet 13 which is a dielectric. A drawing bullet round mark part is the feeding point, and shows an example of the attaching position of the matched load in the case of attaching matched load. drawing 13 -- a conductor -- the whole inferior surface of tongue of the insulating base material sheet 13 which is the KOPURENA track which made 12a the transmission line of microwave, and is a dielectric, and a conductor -- the metal thin film 15 as an earth plate is formed in the top face of the both sides of 12a. drawing 14 -- a conductor -- the TORIPU rate track which made 12a the transmission line of microwave -- it is -- a conductor -- after sandwiching with the sheets 13 and 14 which are 12a dielectrics, the metal thin film 15 as an earth plate is formed in the whole inferior surface of tongue of the insulating base material sheet 13, and the whole top face of the insulating cover sheet 14.

[0020] ** the shape of a field -- tag drawing 15 which has a conductor (field-like antenna) -- a rectangle-like conductor -- 12a -- moreover, drawing 16 -- the conductor of a circle configuration -- it is the microstrip line which made 12a the transmission line of microwave, respectively, and the metal thin film 15 as an earth plate is formed in the whole inferior surface of tongue of the insulating base material sheet 13 which is a dielectric. A drawing bullet round mark part is the feeding point, and shows an example of the attaching position of the matched load in the case of attaching matched load. When the side long when a conductor is a rectangle is circular again, the diameter is equivalent to one wave of the specific frequency f, 1/2 wave, quarter-wave length, etc., respectively.

[0021] (d) he has no insulating base material sheet -- although tag illustration is not carried out -- the anti-theft of this invention -- business -- a tag may not have the insulating base material sheet shown in drawing 1 . namely, -- the case where the goods furnished with a tag or the packing material of these goods consists of an insulating ingredient -- the front face of goods or a packing material -- the resonance circuit section -- direct -- forming -- anti-theft -- business -- it can consider as a tag. For example, when carrying out the laminating of the releasing paper to the rear face of a conductor a glue line and on it and attaching a tag, a releasing paper is stripped and goods or a packing material is pasted directly. It can also form by printing conductive ink directly on the front face of goods or the Takarakura material with a printing machine by using a conductor as a conductor pattern as an option. A resistance ingredient is mixed and printed in this conductive ink, and you may make it a conductor pattern have the resistance for the matched loads of an antenna.

[0022] As a means for not emitting an alarm, even if the shopper who had goods, such as goods which finished payment, in normal passes through between the transmitting antenna 21 shown in drawing 17 , and receiving antennas 22 (1) a conductor -- the approach of carrying out the scratch of the front face and destroying mechanically, and (2) a conductor -- the approach of sticking a metallic foil on a front face -- (3) [whether in the case of a tag with a semiconductor device, the memory in a semiconductor device is rewritten, and] the approach of switching a switch and (4) the case of the tag with resistance shown in drawing 11 -- a resistance part -- **** -- it makes by the thin line, or a part is made thin, and the approach of cancelling tags, such as the approach of melting a thin part with a strong current, is mentioned. [or]

[0023] furthermore, the anti-theft of this invention -- business -- a tag is equipped with two or more resonance circuits, and you may make it the resonance frequency of these resonance circuits differ mutually For example, resonance frequency of the one resonance circuit section is made into the frequency chosen from the semi- microwave band, microwave band, or millimetric wave band 800MHz or more of this invention, and its resonance frequency of other resonance circuit sections is good also as conventional 8.2MHZ(s). the conventional anti-theft by this -- business -- it can consider as the tag also reacted to tag equipment.

[0024]

[Example] Next, the example of this invention is explained.

the shape of a <example 1> straight line -- the anti-theft which has a conductor -- business -- the tag was produced. The tag was obtained by printing 1mm of ****, and the metal pattern with a die length of about 10cm made from aluminum, and forming a conductor on the insulating base material sheet which consists of 15cm long, 5cm wide, and vinyl chloride with a thickness of 0.3mm.

[0025] except for having prepared <example 2> 15cm long, 2cm wide, and the **** base material sheet of the same quality of the material as the example 1 of thickness 0.3mm magnitude, and having formed the conductor of the same quality of the material as an example 1 in 1mm of ****, and magnitude with a die length of about 3cm -- an example 1 -- the same -- carrying out -- anti-theft -- business -- the tag was produced.
[0026] except for having prepared <example 3> 10mm long, 3mm wide, and the **** base material sheet of the same quality of the material as the example 1 of thickness 0.3mm magnitude, and having formed the conductor of the same quality of the material as an example 1 in 0.5mm of ****, and magnitude with a die length of about 5mm -- an example 1 -- the same -- carrying out -- anti-theft -- business -- the tag was produced.
[0027] the anti-theft which consists of the resonance circuit section of the conductor of a half-wave length dipole antenna mold with <example 4> load resistance -- business -- the tag was produced. That is, the center section of the conductor with a die length [on the base material sheet of an example 2] of about 3cm was excised, and the tag was obtained by soldering the both ends of about 75-ohm chip mold fixed resistance to the excised part.
[0028] the anti-theft shown in <evaluation trial> drawing 17 -- business -- it examined whether the tag of an example 1 - an example 4 would function normally using tag equipment. With this equipment, the transmitting antenna 21 and a receiving antenna 22 open predetermined spacing mutually, and are set up, and these antennas 21 and 22 are electrically connected to a control section 24. A control section 24 is constituted so that the signal level of the input signal from a receiving antenna 22 may always be checked, while making the electric wave of the specific frequency f which resonates in the resonance circuit section 12 (drawing 1) of a tag 10 transmit from the transmitting antenna 21. The loudspeaker 26 which emits an alarm is connected to the control output of a control section 24. In this trial, the frequency of 800MHz, 10GHz, and 60GHz was turned to the receiving antenna 22 as a specific frequency f from the dispatch antenna 21 by the control section 24, respectively, and it transmitted. on the other hand -- the anti-theft of an example 1 - an example 4 -- business -- the tag was pasted up on the case of steel iron, these tags were passed between the dispatch antenna 21 and the receiving antenna 22, and it checked whether an alarm would be emitted from a loudspeaker 26. Consequently, the tag of an example 1 is an electric wave with a frequency of 800MHz, further, the tag of an example 3 is an electric wave with a frequency of 60GHz, resonance phenomena were slightly looked at by the resonance circuit section, respectively, though it was feeble to the receiving antenna, the input signal by which receiving level was modulated was received, the tag of an example 2 and an example 4 is an electric wave with a frequency of 10GHz, and the alarm was faintly emitted from the loudspeaker 26, respectively. Thereby, even if the part which attaches a tag was steel iron, it turned out that resonance frequency does not change. if the structure and the receiving set of a tag are improved -- practical anti-theft -- business -- it was corroborated that a tag is realizable.
[0029]
[Effect of the Invention] the anti-theft which constitutes the resonance circuit section with the simple conductor which functions as an antenna to this specific frequency, makes it small insincere, and cannot be easily conspicuous since the specific frequency which is resonance frequency is chosen from the frequency of a semi- microwave band 800MHz or more, a microwave band, or a millimetric wave band according to this invention as stated above -- business -- it can be made a tag. the conventional anti-theft -- business -- in order for the resonance circuit section not to take a coil like a tag, a manufacturing cost is cheap and ends. Moreover, since a specific frequency is made into the frequency of 800MHz or more, when it is high sensitivity, directivity can be given and a mutual intervention with other tags can be prevented. furthermore, the anti-theft which made the conventional frequency of 8.2MHz resonance frequency -- business -- with a tag What the resonance frequency of the resonance circuit section changed and did not function normally when the part which attaches the tag of the goods for a theft monitor was metal From making the frequency of 800MHz or more into resonance frequency with the tag which has the metal thin film of this invention, and using this metal thin film as an earth plate the anti-theft of about 10,000 ability which has an anti-theft function also to the goods of what kind of the quality of the material of the others containing metal, or its packing material, and does not choose an object article -- business -- a tag is realizable.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] the anti-theft of invention concerning claim 1 or 2 -- business -- the perspective view of a tag.
[Drawing 2] the anti-theft containing four conductors with which the array directions differ mutually [invention concerning claim 9] -- business -- the top view of a tag.
[Drawing 3] the anti-theft containing two conductors with which the array directions differ mutually [invention concerning claim 9] -- business -- the top view of a tag.
[Drawing 4] anti-theft with the insulating cover sheet of this invention -- business -- the sectional view of a tag.
[Drawing 5] the closed loop of this invention in a circle -- a line -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 6] the closed loop of the shape of an ellipse of this invention -- a line -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 7] the closed loop of the shape of an ellipse of this invention -- a line -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 8] the closed loop of the shape of a square of this invention -- a line -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 9] the closed loop of the shape of a rectangle of this invention -- a line -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 10] the open loop of the shape of an ellipse of this invention -- a line -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 11] the anti-theft which consists of the resonance circuit section of the conductor of the half-wave length dipole antenna mold with load resistance of this invention -- business -- the top view of a tag.
[Drawing 12] the anti-theft which consists of the resonance circuit section of the conductor of a microstrip line mold which has a metal thin film as an earth plate on the whole underside of the insulating base material sheet of this invention -- business -- the perspective view of a tag.
[Drawing 13] the anti-theft which consists of the resonance circuit section of the conductor of a KOPURENA line mold which has a metal thin film as an earth plate on the whole underside and top face of an insulating base material sheet of this invention part -- business -- the perspective view of a tag.
[Drawing 14] the anti-theft which consists of the resonance circuit section of the conductor of a TORIPU rate line mold which has a metal thin film as an earth plate to whole both sides of the insulating base material sheet of this invention -- business -- the perspective view of a tag.
[Drawing 15] the shape of a field of the shape of a rectangle of this invention -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 16] the shape of a field of the circle configuration of this invention -- the anti-theft which consists of the resonance circuit section of a conductor -- business -- the top view of a tag.
[Drawing 17] the anti-theft of this invention -- business -- the block diagram of tag equipment.
[Description of Notations]
10 Anti-theft -- Business -- Tag
11 Article
12 Resonance Circuit Section
12a Conductor
12b Fixed resistance
13 Insulating Base Material Sheet
14 Insulating Cover Sheet
15 Metal Thin Film
21 Transmitting Antenna
22 Receiving Antenna
24 Control Section
26 Loudspeaker

[Translation done.]

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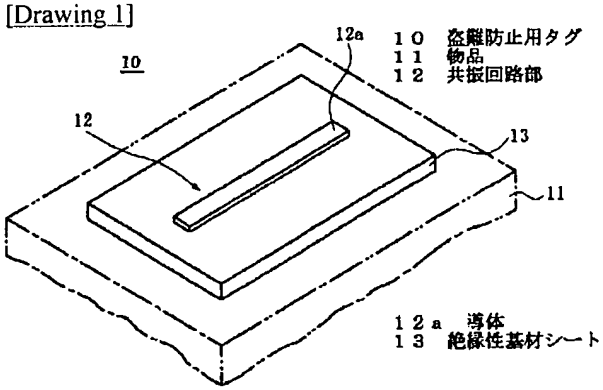
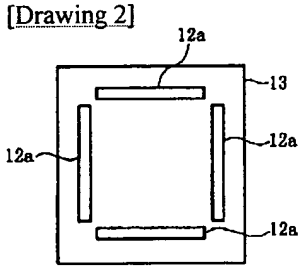
DRAWINGS

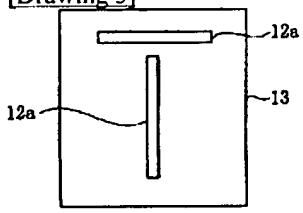
[Drawing 1]



[Drawing 2]



[Drawing 3]



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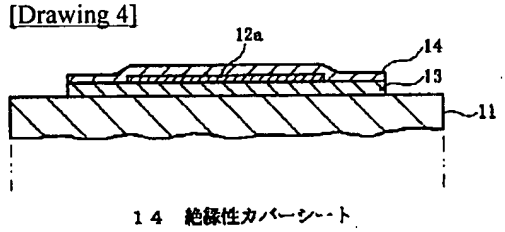

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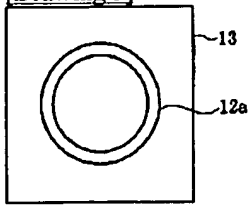

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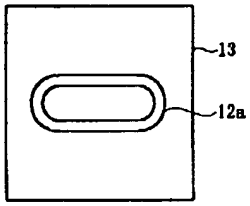

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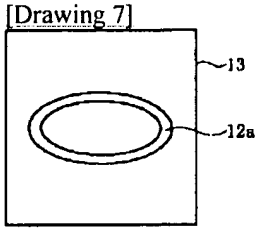

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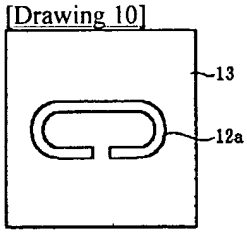

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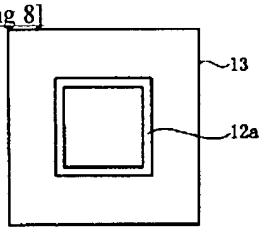

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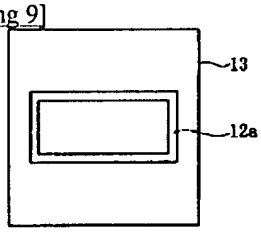
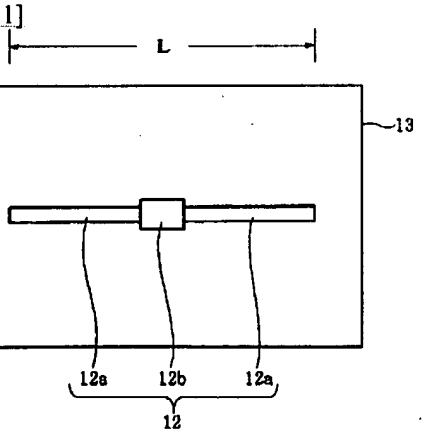
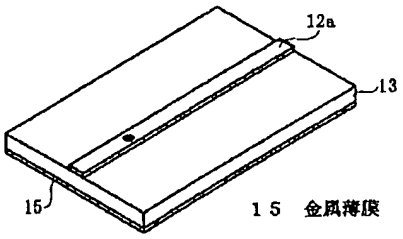


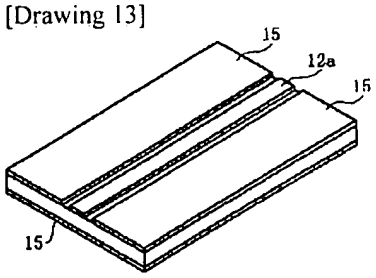
[Drawing 11]



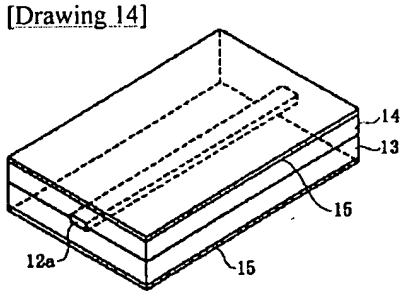
[Drawing 12]



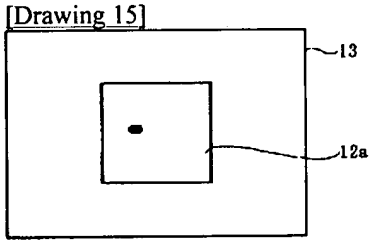
[Drawing 13]



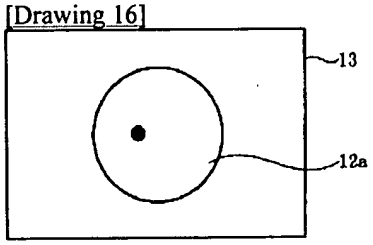
[Drawing 14]



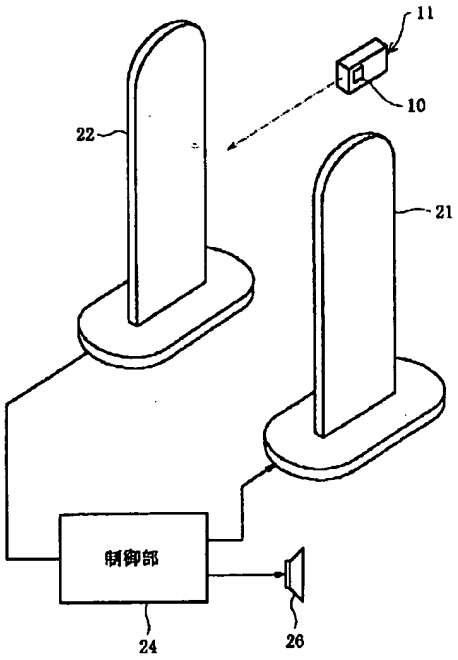
[Drawing 15]



[Drawing 16]



[Drawing 17]



[Translation done.]